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White Spots on Zinc Coatings - Their Causes, and Remedy

Careful Investigations Disclose Seven Reasons for Defects in Galvanized Surfaces—Lower Temperature and Normal Aluminum Content Sometimes Cure the Fault

By Wallace G. Imhoff

THOSE who are closely associated with the art of zincing, or galvanizing, know that defects in galvanized coatings may be caused by one or more of a dozen factors. In some cases, the conditions influencing defects are easily determined and quickly remedied, but in many instances there are so many different factors involved that the practical galvanizer, with limited time and resources, is not able to establish definitely the cause of the trouble. This is particularly true when the same defect seems to appear under entirely different conditions.

A common defect of galvanized coatings which is found in the galvanizing of sheets, metalware, and in fact most any kind of material with a flat surface upon which a spangle, or flake appears, is "white spots." Fig. 1 affords a good example of two large "white spots" which appeared on metalware articles. The defect became so serious that definite steps were taken to determine the cause of the trouble. Article after article had one or more of these spots. At times they appeared in the same location, and at other times were on various parts of the articles.

To fully understand what "white spots" are and what causes them it should be remembered

PRINCIPAL causes of white spots in zinc coatings:

1. Quality of the zinc used.
2. Too high a temperature of the zinc bath.
3. Too long a submersion.
4. Gage of the steel base too light for the heat carried.
5. Withdrawal speed too fast.
6. Low quality, hard, oxidized steel base.
7. Shortage of aluminum in the bath.

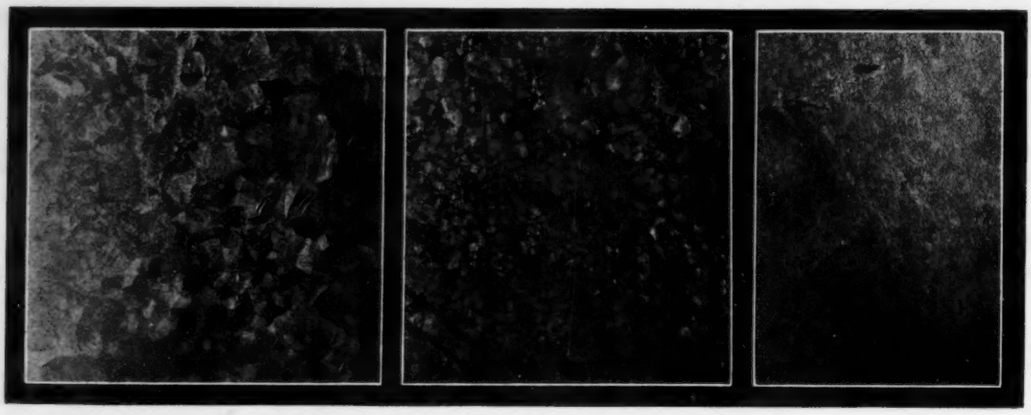


FIG. 2—Effect of varying the temperature of the bath from 790 degrees Fahr. to 945 degrees. Note that at the high temperature the sheet becomes white

that an ordinary galvanized coating may be primarily separated into at least three parts. The first part of the coating is the outside layer, or spangled cover. This is clearly shown at the lower center and lower right parts of the sheet in Fig. 1. The second part of the coating is the white area found underneath the spangled cover. This is shown at the left and slightly to the right of the center of the sheet. The third part of the coating is the dark gray area illustrated by the two large dark gray spots in Fig. 1, which appear above and to the right and below and to the left of the spangled area in the center of the sheet.

Therefore we may define "white spots" as those places on the steel base on which the zinc coating has not been fully deposited, or to state it in another way, spots or places on the steel base which have only received one or two parts of the three, of the zinc coating.

How Trouble Was Traced

In the case under investigation, the spots appeared on galvanized footbaths, and also frequently on buckets and other articles. They often are found on the lighter gages of steel in the sheet industry, on various sheet steel articles in job galvanizing, and on angles, girders, and plates.

"White spots" are not confined to any particular field in the galvanizing industry. The tracing of causes, however, was done on articles of the metalware industry, but the same causes will develop "white spots" in any field of galvanizing.

It was noticed that the spots always were found on one end of the footbath. From this it was evident the spots were not caused in this instance by the quality of the steel base. The segregation, or cause of poor quality in the steel base, would not always occur in exactly the same spot. If the "white spots" could be placed anywhere on the footbath this would prove they were not caused by the quality of the base metal.

The method used to discover the cause was as follows: Since the spots were always in the same place on the end, the footbath was dipped in the flux box sidewise instead of endwise. The result was the same, the spots developing on the end in the same place. This showed they were not caused by the method of dipping.

Next a footbath was dipped as usual, but instead of being withdrawn endwise, it was withdrawn sidewise. The location of the spots was changed, now extending sidewise along the bottom from end to end. This indicated:

1. The "white spots" could be placed anywhere on the bottom.
2. For this reason the spots were not caused by any defect in the base metal.
3. The manner of withdrawal of the article would seem to be the cause of the spots.

All speeds and methods of withdrawal of the article were tried, but the spots remained. The taker-out, the man who lifts the articles out of the bath, was removed and the footbaths were withdrawn by the galvanizer, the man who spins and turns the article round and gives it to the taker-out. But the spots remained. The articles were put in sidewise and drawn endwise, but still the spots appeared. This eliminated all the operators on the kettle as possible factors, narrowing the cause of spots to the quality of the zinc used, and the temperature of the bath.

Quality of Zinc Important

The kettle under observation was filled with grade A zinc. The next kettle was filled with grade B zinc. The temperature of both kettles was brought to 865 degrees Fahr. Footbaths were then run through both kettles at the same time, the stream of pickled articles being split, first one article going in one kettle, and the next article into the other kettle. The test showed that grade A zinc still showed "white spots," while the footbaths from the other kettle containing grade B zinc had first quality

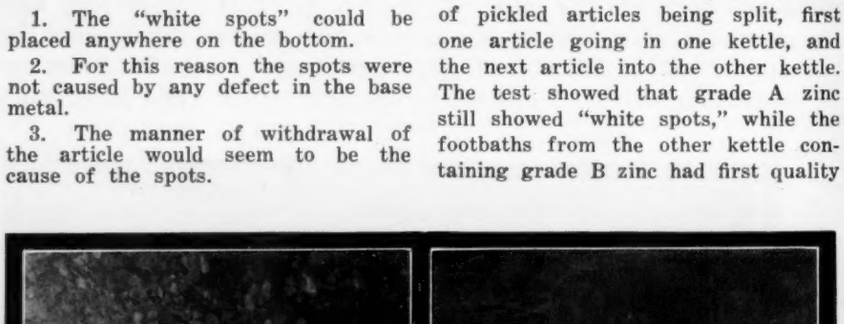


Fig. 3—White coating developed on 28-gage sheet at bath temperature of 945 degrees Fahr. Submersion time, one minute

coatings, without spots. This proved that one cause of the spots is the quality of zinc used.

The next factor to be determined was the temperature of the bath in producing the spots. Therefore, temperature tests in the kettle containing grade A zinc was raised to 900 degrees Fahr., and gradually lowered until the spots disappeared entirely. Tests were made every ten degrees as the temperature was lowered, and all other factors and manipulations were held standard for each test. At 830 degrees Fahr. the spots disappeared. The temperature was raised to 835 degrees Fahr., and still no spots appeared. At 845 degrees, however, they returned, showing that the temperature of the bath also causes the spots, if too high for the quality of the zinc in the bath.

The results of the tests show white spots can be traced directly to two causes:

1. The quality of the zinc in the kettle.
2. Too high a temperature of the zinc bath.

To determine the effect of temperature further experiments were made by varying the temperature of the bath from shortly above the melting point to far beyond the practical temperature for galvanizing.

Temperature Influences Spangle

Fig. 2 shows the effect of varying the temperature from 790 degrees Fahr. to 945 degrees Fahr. for a 28-gage metal base. This brings out the additional information that the temperature of the metal bath influences the size of the spangle on the sheet. The spangles are fairly large on the sheet at 790 degrees Fahr. At 885 degrees, however, the spangles are small, showing the higher temperature with consequently faster cooling causes a smaller spangle.

Attention is directed to another feature of interest to the practical galvanizer, namely, the higher the temperature, the brighter the coating. The sheet at 790 degrees Fahr. is dull and frosted. At 885 degrees it shows strong contrasts and has developed a brightness, or gloss.

Fig. 2 shows the direct effect of temperature on spangle. The spangle has been burned off and the coating is white. This again definitely proves that white spots, in this case the whole of the coating, are caused by too high a bath temperature. Attention is called to the submersion time which was 30 seconds.

The 28-gage sheet shown in Fig. 3 was in the bath for one minute. The white appearance of the coating is brought out more strongly in this illustration. Here again the direct cause of the white coating is due to too high a bath temperature. White spots in 28-gage galvanized sheets will develop at as low a temperature as 900 degrees Fahr.

Tests were made to show the effect of the gage of the steel base in relation to temperature in developing white spots. Fig. 4 shows the effect of temperature on 24-gage sheets when the submersion time is 15 seconds and the temperature of the bath is varied from 790 degrees Fahr. to 935 degrees. The spots are starting to develop at 910 degrees. The sheet is entirely white at a metal temperature of 935 degrees. This shows the gage of metal also influences the development of white spots.

Further tests were made to note the influence of the speed of withdrawal on the coating. It was found by jerking the sheets out that distinct white bands could be developed across the sheet. When the sheets were withdrawn slowly and uniformly the coating was perfect.

Tests on various kinds of steel bases revealed that a low quality, hard steel base will develop spots much easier and quicker than a good quality steel base. The cause seems to be due to the fact the steel is dry, brittle, and no doubt in an oxidized condition. The zinc enters the crevices of such steel and gives it a white frosted appearance.

One more factor was found to influence the development of spots in the zinc coating. This is the aluminum content of the bath. When the temperature of the bath is raised there is a tendency to oxidize out the aluminum as skimmings, faster than at lower temperatures. This causes a shortage of aluminum in the metal. The spots can be definitely traced to this condition.

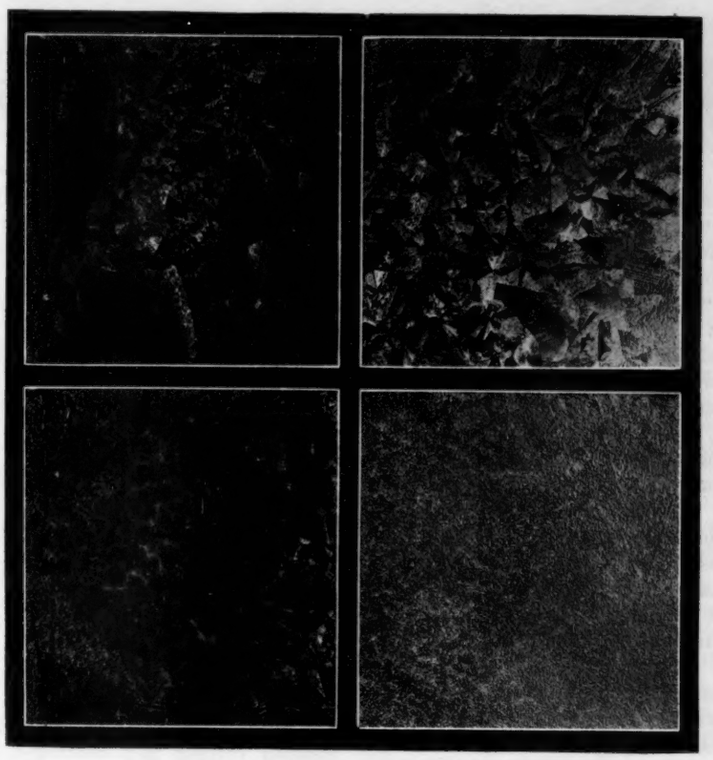


Fig. 4—Effect of temperature on 24-gage base metal. White coating beginning to appear at 910 degrees Fahr. At 935 degrees the whole sheet is white

A summary of causes of spots shows they are developed by any one, or a combination of the following:

1. Quality of the zinc in the pot.
2. Too high a temperature of the zinc bath.
3. Too long a submersion time.
4. The gage of the steel base being too light for the heat carried.
5. The withdrawal speed too fast.
6. Low quality, hard, oxidized steel.
7. Shortage of aluminum in bath.

The only method of eliminating the spots is to standardize conditions, and find out which one of these factors is causing the trouble. First, the temperature of the bath should be lowered and the aluminum content increased. If this does not stop them further investigation will have to be made.

Degasifying Process Facilitates Thick Impervious Plating

Crystals of Coating Are Interlocked with Those of Base Metal to Form Intercrystalline Bond

By F. M. Dorsey

President, Metal Protection Co., Cleveland

THIS is the second of two articles describing the commercial development of a process for the degasifying of metals and for the subsequent plating of the metals to produce a protective metal film. The first article appeared in the April 11 issue of IRON TRADE REVIEW. *Under certain conditions a nickel plate which is soft, ductile and annealable may be produced thus permitting rolling, drawing, welding, soldering and other steps in the fabrication of plated metal. In this article the author discusses the preparation and control of the plating bath.*

IN PREPARING and controlling the plating bath, procedure is determined by these facts ascertained through research and experience, namely, that the annealability of the plated nickel is affected by the following factors named in the order of descending magnitude: basicity, organic compounds and carbon, temperature variation, lead, iron, silicon, copper and hydrogen. The bath also should be sodium free. With so many factors it is obvious that fair results may be obtained under a variety of conditions. Some of the interfering substances may of course be introduced from impurities in the anodes, and it has been found that to produce soft, ductile nickel which will withstand heat treatment only the oxidized anode may be used and this should contain not more than 0.33 to 1.00 per cent of iron and should be free from lead and silicon.

Bath Slightly Acidulated

The bath to operate to the best advantage should be faintly acid, as determined by the indicator previously described. The best running condition is when it contains 10 milligrams of acid per liter, indicated by a distinct grass green color when using the bromo thymol blue indicator. This is equivalent to a *pH* number of 4. The bath should be maintained at 130 degrees Fahr. and its specific gravity should be 18 degrees on the Be. scale. If necessary to dilute, hot water should be used; cold water never should be added, because it causes local precipitation and seed crystals thus formed affect the plating adversely. The hydrogen peroxide as previously mentioned should be maintained in the proportion of 1 cubic centimeter for each liter of the bath. The peroxide aids in preventing pitting and promotes ductility in the nickel plate, but if the anodes are poor, the bath dirty, and the acidity low, peroxide cannot be looked upon as a cure-all. One cause of pitting and of rough metal has been found to be a suspension in the bath, and the pressure of colloids which directly influence the annealability of the plated metal. The organic compounds and carbon, rated above as second in importance in preventing the deposit of annealable metal, are removed in the first instance by the chlorination of the stock solution as prescribed and the peroxide function in removing such compounds in the subsequent runs made in the solution.

The chlorine tends to throw the iron out of solution and is highly useful, in increasing anode corrosion which is desirable. At times, peroxide alone is unable to clean a bath thoroughly and it becomes necessary to cause what is known as agglomeration. This is accomplished by the addition of nickelous hydrate pretreated with hydrogen peroxide or with one of the oxides of nickel, after which filtration through a filter of the Berkfeldt type or through fine filter paper removes the suspensions and solloids thus agglomerated and gives a clean, clear bath. In a study of the influence of peroxide in the plating bath, it has been found that hydrogen peroxide is formed in the bath during electrolysis to the extent of about 1 cubic centimeter of 3.5 per cent strength per liter every 24 hours. Since the presence of peroxide is important and the additions necessary constitute one item of expense, it was desirable to develop a method for its determination.

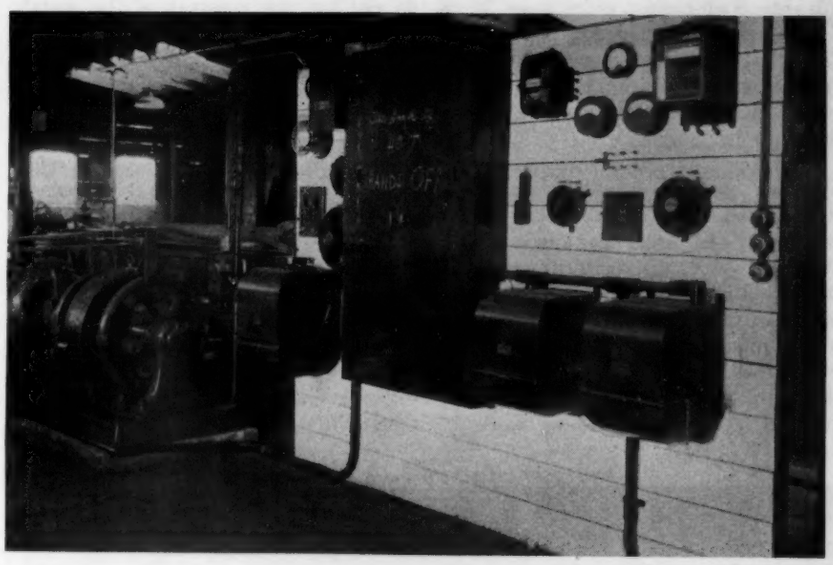
How Solutions Are Prepared

The following procedure is used: Prepare a 1/200 normal sodium thiosulfate solution which should be aged for at least 24 hours. Prepare also a solution of 40 grams of potassium iodide per liter and a standard starch solution of about 1 gram per liter. A 10 cubic centimeter sample of the electrolyte is put into a 100 cubic centimeter casserole and 5 cubic centimeters of concentrated hydrochloric acid added for the purpose of hastening the reaction and thus reducing the air oxidation error. Now add 2 cubic centimeters of the standard starch solution and 1 cubic centimeter of the potassium iodide solution. Titrate with the 1/000 normal thiosulfate solution until the blue color disappears, and does not reappear within 2 minutes. This end point is much sharper than that obtained with the permanganate method and does not seem to be influenced by the colloidal iron content. Theoretically, 2.36 cubic centimeters of the sodium

thiosulphate should correspond to 1 cubic centimeter of 3.6 per cent peroxide per liter on a 10 cubic centimeter sample. It is better, however, to obtain a factor by titrating a water solution of peroxide at known strength.

It has been found that iron and anodes containing a low percentage of combined carbon lead to high consumption, but it also has been determined that a satisfactory percentage of combined carbon can be obtained in the anode if they are cast in cold iron molds, and iron in solution can be removed in accordance with the methods previously described. Reference also has been made to soda, which is disastrous in the bath, causing erratic plating and variations in the operation of the bath. It is also a factor in the production of non-annealable metal. Therefore, when necessary to neutralize a bath which is too acid, nickelous hydrate is employed rather than sodium hydrate. Where acidity is required, sulphuric acid is employed. In some experiments, ferris hydrate in a colloidal condition has been removed satisfactorily by centrifuging. Where copper interferes, it may be removed with nickel chloride, after the addition of which the bath should be boiled with clean, grease free iron dust and the supernatant liquid then decanted. The liquid should then be boiled 15 minutes with nickelous hydrate paste free from sodium and if the copper is not completely removed by this process a small amount of nickel carbonate may then be added at 104 degrees Fahr., the solution chlorinated, and filtered.

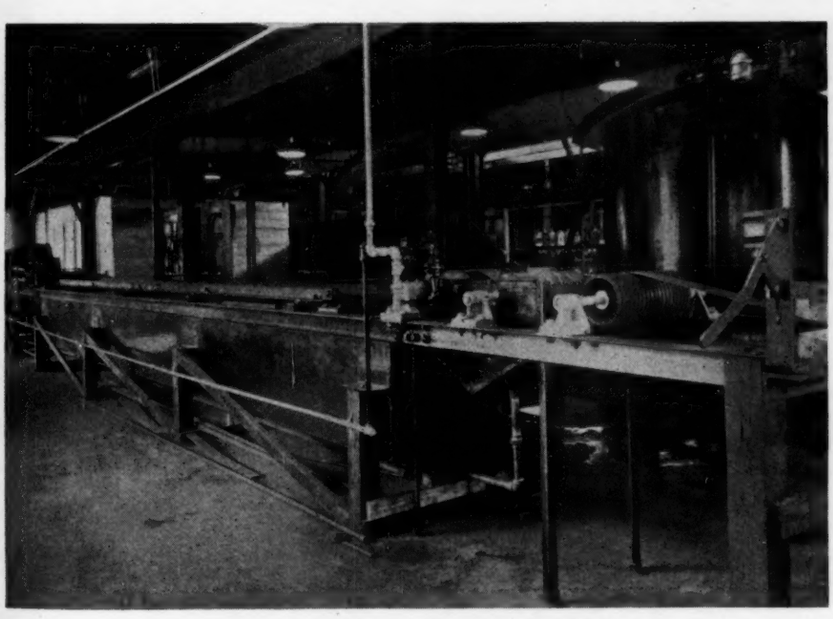
Since water constantly is lost in the bath by entrainment on the work and other ways, and this must be made up, it is customary to maintain the proper concentration of peroxide in the bath by adding it to the drip water. Under no conditions must peroxide be added directly to the bath while it is running, since the oxygen thus introduced tends to combine with the metal to make the nickel brittle and friable. It is important that the temperature of the bath vary not more than 5 degrees during its operation, otherwise the crystal structure will be irregular and this will interfere with the heat treating properties of the nickel. While 130 degrees Fahr. is an optimum temperature, it is not so important to operate at this temperature as it is that the bath should not vary more than 5 degrees from whatever temperature is indicated when it starts.



Generator used in the plating process, and instrument board

At 160 degrees Fahr. peroxide is destroyed, thus definitely establishing a temperature above which satisfactory metal is not deposited. The working range, therefore, is from 128 to 155 degrees Fahr. and means must be provided for heating the bath and maintaining the correct temperature. The current of deposition generates some heat and usually a work load can be found empirically for each bath, such that a satisfactory working temperature can be maintained. However, it is usually better to operate the bath below its power rate and supply some outside source of heat. Cells may, for example, be provided with a steam jacket, electric heaters, or steam coils. The latter, however, must be heavily nickelplated and care be exercised to see that by this means, no lead, zinc, iron, or any alloy containing iron or zinc is brought into the bath. Submerged incandescent lamps also may be employed.

A change in current rate after deposition has commenced also is disastrous, having much the same effect on the metal as a change in temperature. The most efficient current rate is 40 amperes per square foot, that is, at this current rate the most metal of the highest grade for the amount of power used is deposited. This current rate produces 1 pound of metal with 1.8 direct current kilowatt hours of power. Almost equally good metal can be produced with 72 amperes per square foot, but instead of obtaining metal at the rate indicated, direct current kilowatt hours will be required per pound. A current rate of 144 amperes per square foot requires 4 direct current kilowatt hours per pound, and the further dis-

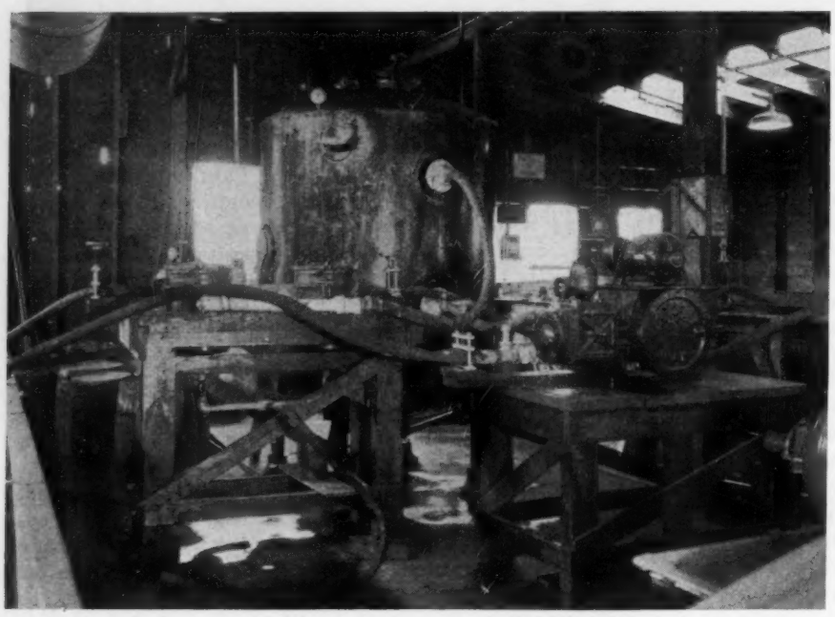


A general view of the plating plant

advantage of higher rates than 36 to 40 amperes per square foot is the fact that under such conditions the faintest traces of any suspended material in the bath will cause rough metal to be plated.

Reference has been made to the optimum acidity of the operating nickel bath at 10 milligrams of acid per liter. In order to operate continuously and satisfactorily the initial acid concentration of the bath must be maintained. The oxidized nickel anodes help do this, but only when the total operating surface of the units is equal to the total cathode surface. If the cathode or work in process is smaller, the bath becomes basic, and if larger, acid. These changes take place slowly, so that acidity tests need be made only every 12 hours, and usually every 24 hours. Fortunately, it is not necessary to correct for acidity and alkalinity by adding acid or nickelous hydrate during operation, since by the raising or lowering of the anodes, thereby changing the relation between anode and cathode, a certain adjustment of acid concentration may be obtained. It is important that all cathodes—that is, work—should be introduced into the bath with the current on.

While a variety of methods have been employed to remove polarization gases and thereby assist in the prevention of pitting, the inventor in this case recommends a procedure which has heretofore been frowned upon. It has been customary to agitate the bath, move cathodes and so on, but the removal of the metallized cathode from nickel baths or the interruption of the current during deposition has been regarded as bad practice, tending upon reimmersion of the cathode to cause deposits to form in layers which tend to separate or peel away from the deposit below it. It has been found, however, that if the period of removal from the bath be sufficiently short, there is no interference with the deposit of a homogeneous plate. Thus with a bath operating at 130 degrees Fahr. it has been found that the cathode may be removed for 10 seconds without destroying the integral character of the entire deposit, while if removal for as much as 15 seconds, the metal subsequently deposited forms a distinct, separable layer. Therefore, in practice, removal from 2 to 6 seconds with a minimum of 2 seconds, is sufficient to permit the hydrogen on the deposited metal to escape from each successive layer of the deposited metal, thus eliminating one of the recognized factors causing pitting and lack of continuity in plated coatings.



Equipment for handling solutions, filtering, heating, circulating and correcting for the pH number

From what has been said concerning the importance of impurities in the bath, it is apparent that wooden vats cannot be used, and chemical stoneware has been found best for the average work. It also is apparent that care must be exercised to prevent dust and particles of organic nature dropping into the bath, that no cathode containing organic material upon its surface be placed in it, that workmen should not place their hands in the bath, and that for the best work the bath should be frequently given the agglomeration treatment and filtered.

It is apparent that the factors shown to control the degasification of base metals and the satisfactory deposition of annealable soft ductile nickel are important and must be observed carefully during the operation. When once set up, the bath is not necessarily more difficult to operate than baths of the older type. It simply requires that directions be followed and normal care exercised to keep operating conditions within the prescribed limits. The results obtained fully justify care in operation, for as shown by the working of the material, an alloy bond is secured. There is no distinct line of demarcation between base metal and the plate. Sheet bars have been given a thick coat of nickel and then rolled by the usual process, including occasional annealing between passes through the rolls, yielding thin sheets of the standard thickness coated with adherent nickel in a thickness predetermined by the amount of metal plated on the bar.

Surface Unaffected by Pressing

Thin sheets have been drawn, spun, and pressed into a variety of shapes without affecting the continuity of the plated surface and without developing cracks, peeling, or other imperfections. Sheets of steel with nickel plating are formed regularly into tubes and the nickel coating welded at the rate of 150 feet per minute, giving a tube so perfectly plated inside and out with nickel as to give great satisfaction as tubes for condensers and even for evaporators in the alkali industry. Sheets also have been degasified, nickel plated and then given a heavier coat of chromium than is ordinarily possible without the peeling of the nickel coat, and such plates have been pressed into fancy panels, shapes for refrigerators, and other similar uses, without producing flaws in the coating. For special purposes where abrasion is to be resisted, as much chromium as may be necesary has been plated successfully over nickel coating on degasified steel.

Degasified iron and steel have been proved to be unusually good metal for soldering, and after coating, soldering, bending, reaming, spot welding, and punching may be done as successfully as with the uncoated material. Vitreous enameling, as previously cited, is much improved by the absence of gases in the surface of the base metal. Just as sheet

bars may be plated and rolled, so also may plated wire be drawn, and where galvanized and other hot coating is to be conducted much improved coating is secured by the degasification of the base metal.

The Metal Protection Co. Cleveland, for more than three years, has been developing the process on a commercial basis, co-operating with engineers from many industries in ascertaining to what extent these new methods may provide for them a new class of structural materials. The work discloses that wherever metallic coating is required and the size and shape of the pieces involved make possible degasification and plating by the process outlined, better adherence, greater freedom from pits and pinholes, and consequently better protection against corrosion can be obtained. Degasification assumes a major role in rendering metals noncorrosive.

Rust Aids or Retards Corrosion

By Dr. Ulick R. Evans

Professor of Metallurgy, Cambridge University

METAL which has been exposed to moderately dry air at ordinary temperatures becomes covered with an oxide film similar to that responsible for the "tempercolors" of iron heated in air, but much thinner. On account of its thinness, the film is invisible while in optical contact with the metal, but it becomes visible if separated from the brightly reflecting basis. Several methods of separation have been worked out, depending on undermining the skin by dissolving the metal on which it rests. This may be accomplished by means of iodine, or by anodic treatment.

On some materials, such as stainless steel, the oxide film produced by exposure to air has a protective character, and is the principal cause of the resistant character of the material. Even in such cases, however, there is a risk of corrosion if a high concentration of chlorides is present. Chlorine ions are capable of penetrating "weak places in the armor," which other larger ions cannot pierce. The film produced on ordinary iron or steel by exposure to air has no lasting protective character. Iron treated with certain oxidizing agents, such as potassium chromate, becomes passive towards certain reagents, but the film readily develops discontinuities, and the passivity vanishes, especially in presence of chlorine ions. The employment of potassium or sodium chromate to avoid corrosion depends on maintaining a concentration of chromate in the water in contact with the metal, so as to keep the film in repair. Here again the method has limitations if chlorides are present.

Ordinary iron or steel immersed in ordinary water, free from "film repairing agents" such as chromates, soon commences to corrode, especially if oxygen has unequal access to different parts of the surface, a condition known as "differential aerations."Electric currents flow between the parts where the film is in good repair and those where it is in bad repair; the latter suffer anodic attack, while the former act as cathodes and suffer no attack. These electric currents have been tapped and measured. It is noteworthy that the current only continues to flow as long as oxygen is supplied as a deplorizer to the cathodic parts. Oxygen is thus needed for the corrosion, but the attack occurs at points on the metal where the oxygen concentration is relatively low.

CORROSION of metals exacts a tremendous toll through its ravages and during recent years investigators have worked energetically to overcome it. At the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 18-22, *one whole day was spent in discussing the subject. One of the interesting papers read at this symposium was, "The Effect of Rust on Corrosion," by Dr. Ulick R. Evans, professor of metallurgy, Cambridge university, Cambridge, England. This contribution was the result of much research work and was so well received that the author since has had the opportunity to present it before a number of technical organizations. At the request of* IRON TRADE REVIEW, *Dr. Evans has prepared the accompanying synopsis of the message which he brought to this country.*

The primary corrosion products of the iron usually are soluble iron scales, but the secondary reaction they yield is the mixture of iron hydroxides known as rust. Rust is to be clearly distinguished from the normally invisible oxide film formed by direct oxidation of iron in the absence of moisture. Rust is always a secondary product, and has no direct protective action on the metal. It serves, however, to delay the diffusion of oxygen to the part coated. If a piece of metal is completely blanketed with rust, corrosion may be retarded, since the presence of oxygen at the cathodic portions of the metal is needed for corrosion. If the piece is blanketed only partly with rust, oxygen will have access to the rust-free portions, and corrosion will then occur on the rust-coated portions. Thus, according to its distributions, rust may appear to be protective or, contrarily, stimulative of further rusting.

In comparing the relative corrodabilities of different materials, the conditions must be clearly defined. In distilled water—under conditions designed to preserve uniform oxygen concentration at all points—steel is rusted and pure iron becomes passive. Under conditions of differential aeration in the same water, both suffer rusting. Vertical specimens of pure iron and steel, partially immersed in N/10 sodium chloride solution, corrode with about the same velocity.

Materials may be divided into two main classes. With class one, the corrosion remains localized (small anodic areas); with class two, the corrosion spreads out and becomes general, (large anodic areas). In the first class, corrosion occurs preferentially along the water line, while in the second class, the area near the water line is normally the part most free from attack. In the first class, chlorides, owing to the penetrating power of the chlorine ions, corrode quicker than sulphates; in the second class, the two sales produce similar effects. Aluminum belongs to the first class; ordinary iron or steel, pro-

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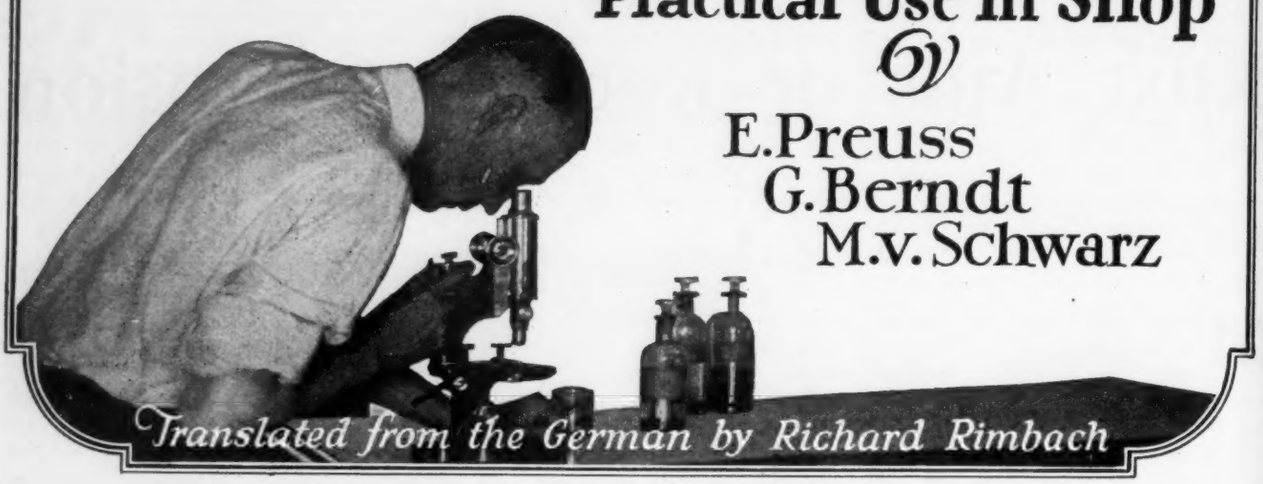
Metallography Simplified for Practical Use In Shop



By

E. Preuss
G. Berndt
M. v. Schwarz

Translated from the German by Richard Rimbach

Chap. XII—Rolling and Cold Working of Steel

IN THE presence of nonmetallic inclusions ferrite and cementite crystallize principally at these points, since they act as nuclei of crystallization and thus favor the formation of crystals. During rolling and forging above 625 degrees Cent., the inclusions are elongated in the direction of rolling. Herewith the usually fairly large ferrite and cementite crystals of the ingot also arrange themselves in lines as indicated by Fig. 173, which shows the microstructure of the web of a girder of carbon steel in which the individual ferrite polygons can still clearly be seen in the light lines. This strongly pronounced linear structure can be avoided by rapid heating or cooling from above Ac_3, but then the Widmannstatten structure occurs, as is to be expected.[48]

Fig. 173—Linear structure in the web of a rolled steel beam in longitudinal section, etched microscopically. X 75

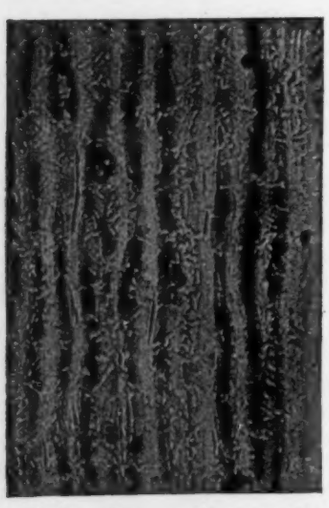


Fig. 174—Primary linear structure in the longitudinal section of a steel rail etched with Oberhoffer's reagent. X 75

According to P. Oberhoffer, two types of linear structure can be distinguished, namely primary and secondary. The former can be made visible by the etching agent of Oberhoffer and is based on the crystal segregation or the unhomogeneous solid solution after solidification. A steel with the usual etching cannot show a secondary linear structure, while etching with Oberhoffer's reagent discloses the primary linear structure. The primary linear structure can be removed by heat treating only with difficulty, the secondary, on the other hand, easily. Fig. 174 shows the primary linear structure of a longitudinal section of a carbon steel rail which had been rolled in one heat from the ingot to the finished rail.

The secondary linear structure consisting of ferrite and pearlite lines is developed by the usual microscopic etching with 2 per cent alcoholic nitric acid, as Fig. 175 shows. It can be removed easily by an anneal of short duration, for example about 5 minutes at 900 degrees Cent., above the upper transformation temperature as can be seen from Figs. 176 and

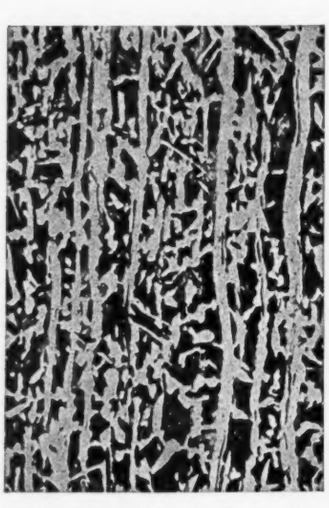


Fig. 175—Ferrite pearlite linear structure (secondary) in the longitudinal section of a steel rail. Etched microscopically. X 75

[48] P. Oberhoffer, *Stahl und Eisen*, Vol. 33, page 1569, 1913.

Fig. 176—*Longitudinal section of the same steel rail as shown in Figs.* 174 *and* 175 *after annealing. It no longer shows the secondary structure. Etched microscopically. X* 75

Fig. 177—*Annealed the same as Fig.* 176, *but etched with Oberhoffer's reagent. The primary linear structure still shows as in Fig.* 174. *X* 75

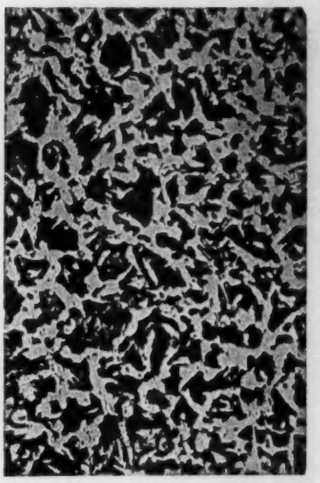


Fig. 178—*Cross section of the same steel rail as Figs.* 174 *to* 177, *etched with alcholic nitric acid*

177, because the latter hardly shows a change in comparison with the primary linear structure of Fig. 174. In spite of this limited heating, the ferrite-pearlite linear structure has almost disappeared and a ferrite meshwork has taken its place as can be seen from Fig. 176. The sections of

Fig. 179—*Cold rolled steel in longitudinal section. Etched microscopically. Rolling structure. X* 70

pieces with linear structure do not show this but show only an apparently normal grain structure corresponding to the sections through the long lines as Figs. 178 and 181 with the same magnification show after primary and secondary etching. The same carbon steel rail whose longitudinal section was shown in the rolled state in Figs. 174 and 175 is represented here in cross section.

It is not possible to recognize any preferred direction of the formation of the crystal grains, as the numerous illustrations so far shown prove, either on the unworked iron or on that rolled at temperatures above 625 degrees Cent. On the contrary, they have on an average, the same dimensions in all directions. If now such steel is mechanically worked, that is rolled, drawn or forged, at temperatures below 625 degrees Cent., also at room temperature, the crystals assume an elongation or stretching corresponding to the cold working. From X-ray investigations it recently has been shown that with such cold working an orientation of the crystals also takes place, so that the axes arrange themselves in a certain location to the direction of elongation. Even after low recrystallization temperatures, this orientation remains in part, which can be seen from the location of the etching figures.[49] From this the effect of the mechanical working, known as cold working, below 625 degrees Cent., also can be recognized, and the

[49]Compare G. Tammann and H. H. Meyer: Zeitschrift fuer Metallkunde 1926, page 399 ff.

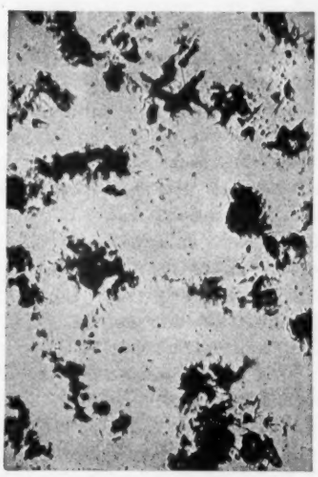


Fig. 181—*As Fig* 178, *but etched with Oberhoffer's reagent*

direction of the working process, or rolling, can be determined. The ratio of the average cross sectional dimensions of the crystals to their average lengths is designated as elongation rate. The latter, however, is not necessarily always a measure of the cold working, which has taken place since

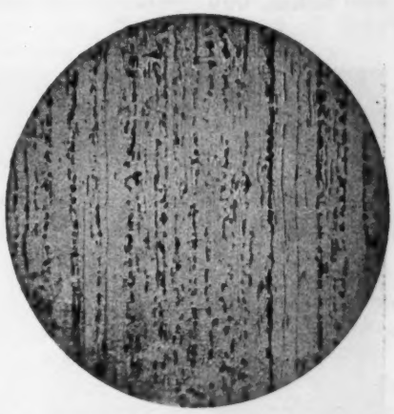


Fig. 180—*Cold rolled steel in longitudinal section. Etched microscopically. Rolling structure. X* 70

for considerable elongation a disintegration of the greatly elongated grains into two or more of lesser length occurs. Figs. 179 and 180 give the microstructure of two boiler plates, which, in addition to the linear structure show a clearly preferred elongation of the crystal grains and therewith the direction of rolling which proves, as there was no other influence noticeable on the surface of the plates, the plates had been rolled at least partly at temperatures below 625 degrees Cent.

In general, the tensile strength of iron increases somewhat with the grain elongation due to cold working.

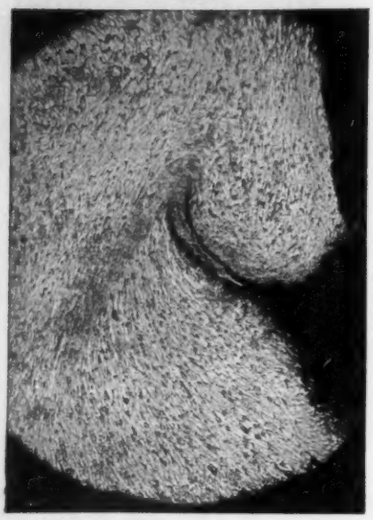


Fig. 182—Distortion of the crystals at a calked seam of a boiler plate in cross section. Etched microscopically. X 50 (O. Bauer)

The percentage elongation, however, decreases but little in the beginning, but is reduced considerably with a greater degree of deformation. Cold working has been recently applied to a great extent in order to increase the strength of metals, particularly by cold rolling, while formerly cold working almost exclusively had been used with wires. According to the classical experiments of J. Bauschinger, the elastic limit of soft steel is increased in the direction of stress by cold working. This is extensively used in the United States.[50] Of particular interest in connection with the recrystallization phenomena, is the aging of cold worked steel which, at normal temperatures proceeds slowly, but in boiling water, which is 100 degrees Cent., takes place in 15 minutes. The heating to the so-called "blue brittleness temperature," 200 to 300 degrees Cent. in cold-worked soft steel is dangerous, as then the toughness decreases considerably. The latter is just as small as with deformations in

[50]Compare J. A. van de Broek, Carnegie Scholarship Memoirs, Vol. 9, and Journal of the Iron and Steel institute, London, May, 1918. Also the report of M. von Schwarz in Zeitschr. fuer Metallkunde, Vol 12, No. 8, pages 150-158.

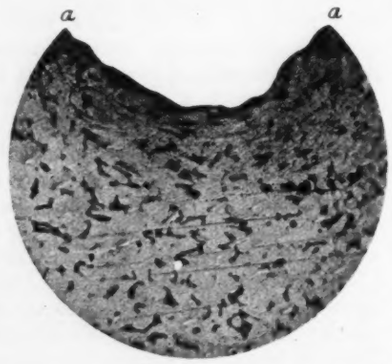


Fig. 184—Distortion of the crystals of a numbering die in section. Etched microscopically. X 60

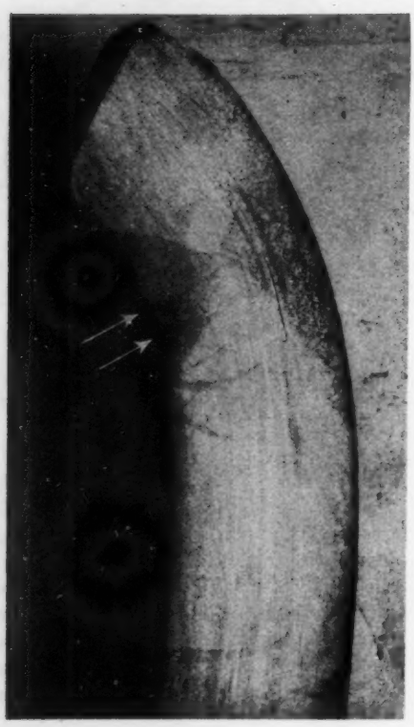


Fig. 185—Force effect stripes on the section through the flange of a steam boiler show the internal relation between the direction of the cracks and the pronounced corrosion occuring there, especially visible at the two arrows. Etched according to A. Fry. Actual size. (M. v. Schwarz)

the temperature range of 200 to 500 degrees Cent., where the blue brittleness occurs. Blue brittleness obtained its name because the surfaces of the fracture showed a blue annealing color. It can become dangerous in the case of steam boilers, because most of the cracks here observed can be traced to cold working and aging.[51] The importance of annealing of cold-worked carbon steel already has been pointed out, and also the use of alloy steel and of the new izett steel. In cold-hammered bolt heads and cold-rolled screws care must be taken that they are never heated to recrystallization temperatures, or they develop large crystals and are sure to break. Slight cold working at which the plastic limit has been slightly exceeded cannot be recognized on the normally

[51]Compare M. von Schwarz: Die deutsche Metallwarenindustrie 23, No. 374 page 85 and 112, 1925 and Zschr. d. Bayr. Revisions Vereins Vol. 27, No. 11, page 84-86, 1923; also the above mentioned paper of M. von Schwarz and W. Bergmann.

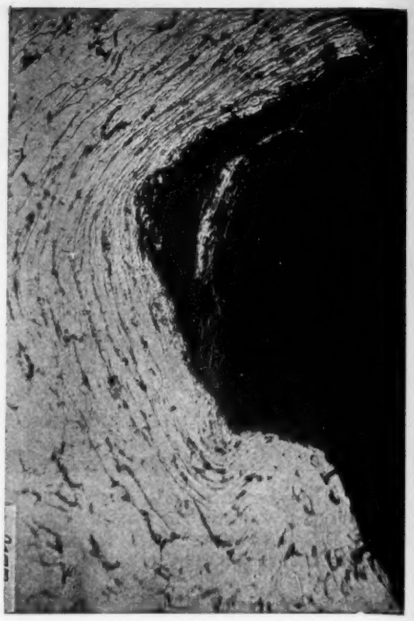


Fig. 183—Distortion of the crystals at the base of the thread of a steel screw broken off due to defective cutting tool. Etched microscopically. X 75 (C. Bach and R. Baumann)

etched sections, as the deformation of the crystals is small. The etching method of Fry, Chap. IV, has, however, given a means of making the "force effect figures" visible. Some years ago a relation was discovered between the force influence figures, corrosion and formation of cracks as Fig. 185 shows in the section through

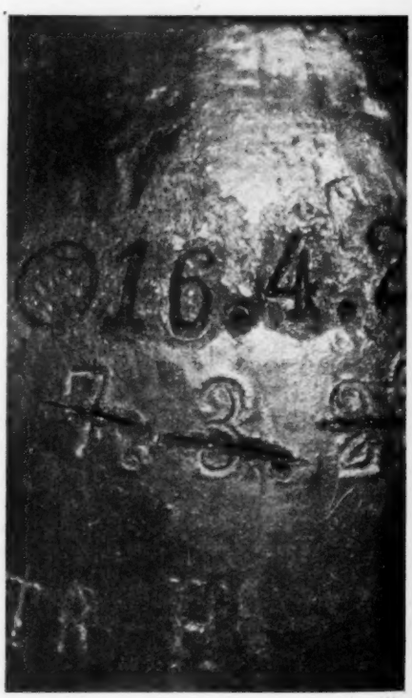


Fig. 186—The stamped numbers and cancellations by chisel marks act as notches (M. v. Schwarz)

the steel flange of a steam boiler.[52]

An actual brittleness then occurs only when the cold-worked steel is heated to a corresponding temperature—about that of the yellow annealing color. This is particularly dangerous for boiler plates where by careless knocking off of the boiler refractory cold working occurs. A similar mistreatment of the material is shown in Fig. 182, a caulked boiler seam. The improper caulking not only resulted in a pronounced elongation of the crystals, but also actual overlappings have occurred, which act like notches and therefore, favor the formation of small cracks.[53] In fact, the ship's boiler cracked after 26 years' operation, over the greatest part of the outer line of rivet holes under a water pressure test at eight atmospheres.

Similar distortions of structure can be observed in screw threads, which have been made with a poor threading die, as in Fig. 183, which shows

[52]Recently this phenomenon was studied thoroughly by F. Koerber and A. Pomp; Mitt aus dem K. W. Inst. f. Eisenforschung Vol. 8. Lief 9.

[53]O. Bauer, Mitt d. Mat. Pruef.—Amtes, Vol. 35, page 194, 1917.

(*Concluded on Page* 1195)

Grain Structure Influences the Stability of Ferrosilicon

By James Silberstein

COMMERCIALLY produced 50 per cent ferrosilicon, which is used exclusively as a deoxidizer and scavenger for iron and steel, has the undesirable property of disintegrating in the coure of time. The commercial product contains carbides, silicides and phosphides of aluminum and calcium. These impurities separate out at the grain boundaries of the ferrosilicon crystals and are attacked by the moisture of the atmosphere, resulting in intergranular disintegration of the product and simultaneous formation of poisonous gases. Suppression of this disintegration is, therefore, highly desirable. Ferrosilicon with a silicon content of 50 per cent or more disintegrates more rapidly than when the silicon content is below 50 per cent, and manufacturers, therefore, generally keep the content of this element between 45 and 50 percent.

The porosity of the product also influences the rate of disintegration. A porous product deteriorates faster than a dense material, because the diffusion of air and gases is greater in the former case. This is easily demonstrated by the following experiment. A piece of sand-cast 50 per cent ferrosilicon is broken into two, one of them is soaked in oil for a few minutes, and both are kept together for observation. It will be found that the piece which had been soaked in oil will not be affected for weeks and even months, while the other piece may disintegrate within a relatively short time. It is, however, not a practical proposition to soak ferrosilicon in oil to keep it from disintegration, because by addition of the ferrosilicon to the molten iron or steel bath, the sudden volatilization of the oil might cause explosions.

In the production of 50 per cent ferrosilicon a product having a fine-grained crystal structure disintegrates far less rapidly than a product with a coarse-grained structure, other conditions naturally being equal. This is due to the fact that the the impurities in the former case are scattered among a greater number of ferrosilicon crystals, and the amount of impurities per crystal is relatively small. This is equivalent with a product of higher purity from a disintegration point of view, and the low rate of deterioration is, therefore, easily explained.

Fifty per cent ferrosilicon formerly was tapped almost exclusively into sand molds. This resulted in a coarse grained, porous product. In recent years ferrosilicon is poured into chilled molds with the result that a fine grained, dense structure is obtained and the metal is much more stable. Ferrosilicon cannot be tapped direct from the furnace into the iron molds because its temperature when coming from the furnace is much higher than its solidification temperature and severe corrosion of the iron molds would consequently take place. The ferrosilicon is, therefore tapped into a brick-lined ladle and, after cooling, poured from the ladle into the molds. During the cooling period some of the impurities, being specific lighter, raise to the surface where they form a thin cover of slag. This is skimmed off before pouring.

Construction of Steel-frame Houses Increasing in West

MANY beautiful homes are being built in the western and southwestern states using the steel frame type of construction which originated in the eastern part of the country where it is quickly gaining popularity. The many obvious points of advantage in steel-frame houses and small buildings are appealing to builders and buyers, indicating a more extensive demand for them. The Colorado Fuel & Iron Co. has adopted a system licensed under a special form of contract to establish structural steel fabricators, within the trade territory of the Colorado company. To identify this type of construction with its own company and works it designates it as the Minnequa system of steel building construction.

The interesting feature of this development is that the leading steel manufacturer in the Southwest conducted extensive research work to determine the merits or demerits of the system, and having fabricated the material and watched the construction of many houses and small buildings now is enthusiastic in its praise.

Evidence of this is to be found in the current issue of the Colorado company's *Industrial Bulletin*, featuring the system which "comprises complete master plans and specifications and the personal instruction of specially trained service engineers." The *Bulletin* further says:

"The master plans cover detailed drawings of standardized structural members, provision being made on these drawings for the insertion of the size and length of the members, to be filled in by the fabricator's shop draftsman when the detailed members are being selected to suit the architect's plan for which the steel frame work is to be fabricated. This eliminates the necessity and expense of having to make detailed drawings of the steel frame work for each individual job, as is ordinarily necessary in designing steel under standard

structural engineering practice.

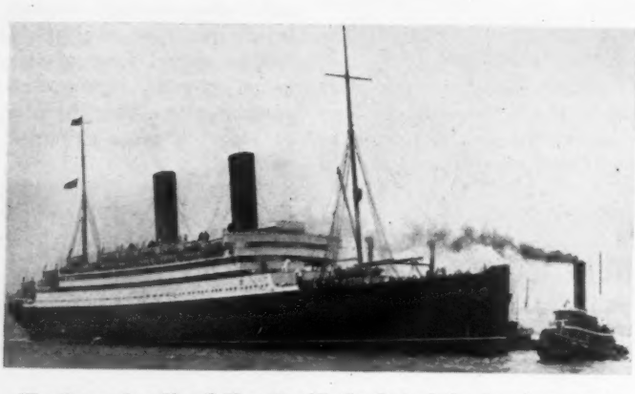
"Because of the comparative lightness of the floors and roofs of residences and small buildings, structural members are made up of very light standard hot rolled sections. The sizes of these sections are inserted by the fabricator's draftsman to suit the individual plans for which the steel frame work is to be made. Therefore, no more steel is used than is necessary to carry the required loads. These members are then fabricated in the structural shop, after which they are painted, marked and delivered to the site on which the building is to be erected.

"The foundation for a steel framed residence is laid the same as for ordinary construction, or in accordance with local city building code, with the exception of the placing of anchor bolts which secure the steel frame work to the foundation.

"The system provides an economical and rapid method of arranging an assembly drawing, or marking sheet, from which the various members are bolted together in their respective places, one story at a time, until the entire frame work of the structure has been erected.

"After these members have been assembled, which form a complete frame work rigidly braced in every direction and properly anchored to the foundation, adequate provision has been made for unlimited combinations of materials to be applied to the steel frame work which forms the inner and outer walls, floors, ceilings and roof of the structure."

Large Delegation Going to Foundry Congress in London



The Carmania will sail May 10 with the first of the American group

OF THE Americans who will attend the Third International Foundrymen's congress in London, June 11-15, about 40 will constitute the official delegation of the American Foundrymen's association, on the preconvention tour of Great Britain. This delegation will be headed by S. T. Johnston, president; Fred Erb, vice president, and C. E. Hoyt, executive secretary-treasurer of the American association, and will sail from New York on the Carmania at midnight, Friday, May 10. The delegation is scheduled to leave London, May 27, on the tour of Great Britain. This will include a visit to the Northeast coast exhibition at Newcastle-on-Tyne, which is to be opened by the Prince of Wales. The following is a complete list to date of the persons who have indicated to the American association their intention to attend the third foundrymen's congress, to be held in London:

C. H. Gale, Grand Rapids, Mich.
L. W. Olson, Director, Past President, A. F. A., Ohio Brass Co., Mansfield, O.
Mrs. W. L. Olson.
S. W. Utley, Director, Past President, A. F. A., Detroit Steel Castings Co., Detroit.
Mrs. S. W. Utley.
Dan M. Avey, Editor, *The Foundry*, Cleveland.
Mrs. Dan M. Avey.
R. F. Harrington, Hunt-Spiller Mfg. Co., Boston.
C. E. Hoyt, Executive Secretary-Treasurer, A. F. A., Chicago.
Mrs. C. E. Hoyt.
James W. Gibney, W. P. Taylor Co., Buffalo.
George F. Snyder, Snyder Foundry Supply Co., Los Angeles.
Mrs. George F. Snyder.
E. M. Ayers, Ayers Mineral Co., Zanesville, O.
J. B. Goostray, Hunt-Spiller Mfg. Co., Boston.
George H. Wadsworth, Wadsworth Core Machine & Equipment Co., Akron, O.
Mrs. George H. Wadsworth.
E. L. Loges, Kramer Bros. Foundry Co., Dayton, O.
H. Cole Estep, Director, Chairman, A. F. A. Committee on International Relations, Penton Publishing Co., Cleveland.
Mrs. H. Cole Estep and Master Edward Estep.
Joseph F. Froggett, Penton Publishing Co., Cleveland.
A. E. Hageboeck, Director A. F. A., Frank Foundries Corp., Moline, Ill.
Mrs. A. E. Hageboeck.
P. W. Mulder, Almont Mfg. Co., Almont, Mich.
Mrs. P. W. Mulder.
V. E. Minich, American Foundry Equipment Co., New York.
S. T. Johnston, President A. F. A., S. Obermayer Co. and National Engineering Co., Chicago.
Mrs. S. T. Johnston.
R. E. Bryant, Jefferson Union Co., Lockport, N. Y.
Mrs. R. E. Bryant.
Fred Erb, President-Elect, A. F. A., Erb-Joyce Foundry Co., Detroit.
Mrs. Fred Erb.
Wm. W. Paulson, Thomas Paulson & Son, Inc., Brooklyn, N. Y.
Mrs. Wm. W. Paulson.
Wm. J. Grede, Liberty Foundry, Inc., Wauwatosa, Wis.
Mrs. Wm. J. Grede.
E. N. Cabaniss, Joseph Dixon Crucible Co., Jersey City, N. J.
J. S. Law, Joseph Dixon Crucible Co., Jersey City, N. J.
R. E. Kennedy, Technical Secretary A.F.A., Chicago.
James T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.
M. J. Evans, Whiting Corporation, Harvey, Ill.
Mrs. M. J. Evans.
Robert Crawford, Atlas Foundry Co., Detroit.
Mrs. Robert Crawford.
Miss Crawford.
R. W. McIlvaine, R. W. McIlvaine Co., Chicago.
Mrs. R. W. McIlvaine.
Edward Frohman, S. Obermayer Co., Pittsburgh.
Herbert Weaver, Canadian Foundry Supplies, Ltd., Montreal, Can.
Wm. H. Nicholls, Wm. H. Nicholls Co., Inc., Brooklyn, N. Y.
Robert J. Turnbull, Arcade Mfg. Co., Freeport, Ill.
John C. Pangborn, Pangborn Corp., Hagerstown, Md.
Frank Dodge, Werner G. Smith Co., Detroit.
Mrs. Frank Dodge.
H. B. Hanley, Whitehead Bros. Co., Rochester, N. Y.
Mrs. H. B. Hanley.
W. B. Willard, Grand Rapids, Mich.
Mrs. Kirk, Detroit.
F. R. Ringle, Herman Pneumatic Machine Co., Pittsburgh.
Thomas Kaveny, Jr., Herman Pneumatic Machine Co., Pittsburgh.
H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.
Mrs. H. A. Schwartz.

Welding School Expands Its Facilities

To meet the increasing demand for practical instruction in arc welding, the welding school maintained by the Lincoln Electric Co., Cleveland, is greatly expanding its facilities. While students of the school are selected carefully, it probably will be necessary to more than double the amount of welding equipment before the end of the current year. At present the waiting list is increasing constantly.

No tuition is charged and any mechanic is free to take the work up to the capacity of the school. The course is of six weeks duration and is intensely practical in character. Students are required to conform to ordinary shop rules and must keep the conventional shop hours. Frequently, it happens that experienced arc welders will spend from a week to ten days in a sort of extra curricular course to learn special work where they feel their experience to be insufficient for a contemplated project.

Concrete Floors for Residences a New Reinforcing Market

Campaign Sponsored by Portland Cement Association Will Open New Field for Concrete Bars—Educational Program Is Planned

By W. D. M. Allan

Manager, Cement Products Bureau, Portland Cement Association

CHOOSING wisely the new market to be developed is important because not all are worth while. Business can be had in new fields where sales expense is entirely out of line with probable profits. Expanding a market without regard for costs and returns will lead to trouble just as surely as failure to protect established markets. Let us remember that the new field is new only to us, that in a broad sense wholly new markets do not exist but are markets that must be taken away from some other industry that is already established, and that these new markets only furnish new fields for competition, usually of the keenest kind.

Probably no better justification for trade associations exists than co-operative effort to educate and develop new markets. Certainly, in the field of concrete first floors for residences, the Concrete Reinforcing Steel institute, working as an association, can do a much better job to develop this market than can its members working independently.

Since 1920 the number of new residences built each year has increased considerably and it is conservatively estimated that now more than 500,000 new homes are built annually, with a first floor area of about 300,000,000 square feet. Sales resistance to reinforced concrete first floors for residences falls under the following headings: 1. Precedent; 2. appearance; 3. comfort; and 4. cost.

Precedent is hard to overcome. Floors for most of us always have been built of wood and new home builders do not think of any other types. The home builder's inclination often is strengthened by the attitude of the architect and contractor. All promotion activities should be used to overcome this inertia, but it is primarily the job of advertising to presell the prospect.

Reinforced concrete floors can be just as beautiful as any other type. The term "concrete floor" connotes for the prospect something akin to a sidewalk, admittedly a thing of utility but not to be used in his living or bedroom. Through consumer advertising, both magazine and direct mail, the prospect must be taught that the concrete first floor is primarily a structural floor and can be surfaced just the same as that type with which he is familiar.

The uninformed think of concrete residence floors as cold and hard and something thoroughly uncomfortable. Concrete does feel cold to the bare skin and as a material to stand on, it is tiring to the feet, but it is not proposed to use unsurfaced concrete in either of these ways in residences. Put the same kind of covering on the concrete floor that you put on the hard wood floor and one will be as comfortable as the other.

Now we come to the fourth and most important obstacle to sales—cost. Under present conditions, it is obvious that only through a miracle reinforcing steel and concrete could be sold. Current prices three to five times the cost of wood floors are rather the rule than the exception. Every case that we have checked shows that the high price was due to lack of familiarity with concrete floor construction. To sell concrete floors in residences, it is necessary to keep the costs down as low as a skilled, efficient and sympathetic organization can consistently operate at a fair profit.

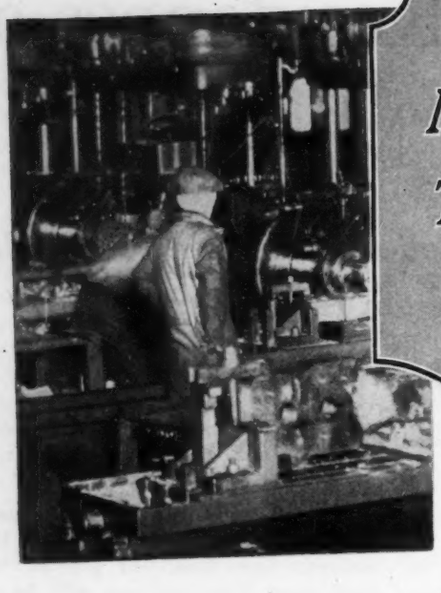
I have said enough to justify our belief that the concrete contractor is an important factor in putting across reinforced concrete first floors for residences. The question is then, "How shall we reach this group?" There are between 40,000 and 50,000 of them in business of whom 10,000 to 12,000 are capable of taking on new work.

To reach the leaders we are planning group meetings to be held in every important market. Two series of conferences, one dealing with sales problems and the other with construction methods and quality concrete will be presented. They will be held in the winter months for the most part and each one will require the better part of a day. Usually the sales conference will precede the construction conference, where possible they will be arranged for succeeding days.

The principal sales reason given for

(*Concluded on Page* 1195)

WITH the Portland Cement association just initiating a campaign for concrete floors in residences, a new field for reinforcing bars is opened to the steel industry. The market holds possibilities which should be of considerable interest to mills and reinforcing engineers and distributors. Just how large this potential market is and how it should be developed is revealed in the accompanying article, an abstract of an address made before the annual meeting of the Concrete Reinforcing Steel institute, April 15-17, at Asheville, N. C. The author, W. D. M. Allan, is manager, cement products bureau, Portland Cement association, Chicago.



New Machine Tools and Shop Equipment

"Without tools man is nothing, with tools he is all."—Carlyle

Depreciation Rates are Debatable

DEPRECIATING machinery and machine tool equipment to account for wear and obsolescence is a problem which attaches a wide divergence of opinion. Papers on this subject have been read and discussed before various technical societies, but thus far no standardized policy is followed. Each industrial plant seems to have its own idea of the best practice. Consequently American manufacturers will be interested in the depreciation rates recommended by the federation of German machinery builders, composed of 88 trade associations employing about 500,000 people. The National Machine Tool Builders' association has just broadcast the following report prepared by United States Trade Commissioner James E. Wallis Jr., Berlin:

"The Verein Deutscher Maschinenbau Anstalten (Association of German Machinery Manufacturing Establishments) has prepared a list of standard depreciation rates for the guidance of their members in computing manufacturing costs. This should be of considerable interest to American manufacturers in comparing their methods with those of the Germans. It should be noted that, although the German association has gone into the matter very carefully, the individual manufacturer apparently seldom adheres to the instruction. On the contrary, it may be said that the general

(*Concluded on Page* 1194)

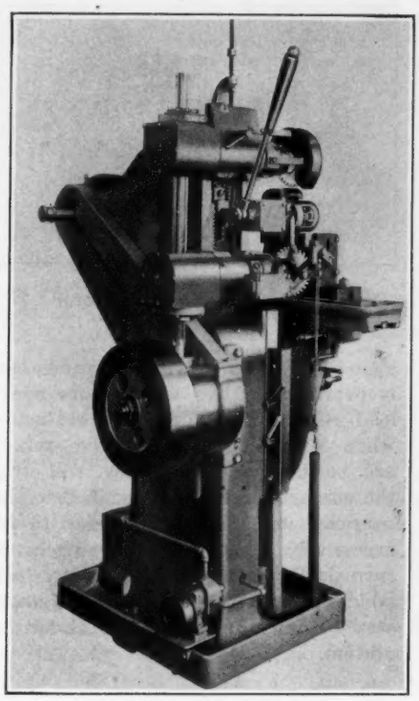
Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date Described	Page
Grinding wheel	Four abrasive segments mounted in 11-inch wheel	Blanchard Machine Co.	73	April 4	928
Die punching press	Built with six punches and dies, individually operated	Zeh & Hahnemann Co.	74	April 4	928
Wire reel	For use with cable or wire rope stranding machines	Pittsburgh Producers Supply Co.	75	April 4	928
Switches	New line of master and limit switches, cam operated	General Electric Co.	76	April 4	928
Pipe machine	Duplex 12-inch type; designed for oil field work	Bignall & Keeler Machine Works	77	April 4	929
Gear shaver	For finishing teeth of rough cut gears to true involutes	Pratt & Whitney Co.	78	April 11	1000
Double-pawl clutch	Incorporated in design of new line of presses	American Can Co.	79	April 11	1000
Air drill	Rotor governor controls speed and air consumption	Rotor Air Tool Co.	80	April 11	1001
Polishing machine	Also buffing; double spindles entirely independent	Excelsior Tool & Machine Co.	81	April 11	1001
Buckets	Open and closed types for materials handling	Reichmann-Becker Polyp Co.	82	April 11	1001
Coal loader	Electric operation; continuous loading action	Covington Machine Co.	83	April 11	1001
Pump	Hydraulic; working pressures up to 6500 pounds	John Robertson Co.	84	April 11	1001
Truck	For carting loose materials about shop	Pittsburgh Producers Supply Co.	85	April 18	1067
Gear generator	Generates large pitch helical, spur and herringbone gears	Farrel-Birmingham Co. Inc.	86	April 18	1067
Polishing machine	Grinds, polishes and buffs; four grinding wheels	Excelsior Tool & Machine Co.	87	April 18	1068
Punches and retainers	Complete line and interchangeable; high safety factor	King Works	88	April 18	1068
Strip heater	Electric; 24 inches long; for 110 or 220 volts supply	General Electric Co.	89	April 18	1068
Pouring device	Trolley runs on I-beam; ladle operated electrically	Modern Pouring Device Co.	90	April 18	1068
Lever punch	Capacity of 5/16-inch hole in 5/16-inch iron	Excelsior Tool & Machine Co.	91	April 18	1069
Milling machines	Standard universal and standard plain units	Brown & Sharpe Mfg. Co.	92	April 25	1132
Tool holder	Floating type; friction is minimized	Apex Machine Co.	93	April 25	1133
Abrasive tools	Carborundum reamers and files	Carborundum Co.	94	April 25	1133
Milling head	Combination side and end type	Giddings & Lewis Machine Tool Co.	95	April 25	1133
Switch	Direct-current cam switch for controlling auxiliaries	General Electric Co.	96	April 25	1133
Milling machine	Double-spindle type with opposed feed	Kent-Owens Machine Co.	97	May 2	1193
Cranes	Locomotive cranes with center-drive superstructures	Thew Shovel Co.	98	May 2	1193
Locomotives	Industrial type; gasoline powered and gear driven	Cincinnati Car Corp.	99	May 2	1193
Switch	Combines magnetic and circuit switches and fuses	General Electric Co.	100	May 2	1194
Lathe	Larger model of single-spindle automatic unit	Jones & Lamson Machine Co.	101	May 2	1194
Motor	Fan-cooled and totally-enclosed; uses direct current	Westinghouse Electric & Mfg. Co.	102	May 2	1194

Double-Spindle Milling Machine Announced

No. 97

Kent-Owens Machine Co., Toledo, O., has placed on the market a new double spindle milling machine with opposed feed for piston slitting and similar operations. Two heads are fed toward each other simultaneously by a hand lever. Both spindles and the backshaft are mounted on taper roller bearings. A flywheel pulley and rugged box section frame insure chatterless operation. The machine in the accompanying illustration is shown with fixture for slitting pistons. Included in the design of this unit is a troughed base for catching chips and oil. Knee, cross-slide and table have deep sections and large surface bearings. The large coolant tank is cast integral with the base. Table is 26 inches long, 8 inches wide and the distance between spindles is 4¾ inches minimum and 12½ inches maximum. Hand lever permits 4-inch horizontal table feed and a 17-inch feed is obtainable by crank. Cross saddle feed is 5 inches. Spindles are driven through silent chain and splined shaft and hardened alloy steel spiral bevel gears mounted on ball bearings. The cone pulley has two steps, 10 inches and 7 inches in diameter and a 3⅛-inch face.



No. 97—Double spindle milling machine with opposed feed

Locomotive Cranes Have Diesel Power Plants

No. 98

Thew Shovel Co., Lorain, O., announces the addition of 15 and 20-ton locomotive cranes to its line of crawler mounted crane equipment. These cranes are furnished with electric or diesel power plants. Plug-in, trolley and third rail systems can be had for the electric powered units. Ability to perform simultaneous operation of the boom and carriage is due to the center drive superstructure which transmits the full power of the motor to the three power shafts, with clutch arrangements to permit engaging them separately or simultaneously. Booster bands on the hoist and swing shafts utilize the engine power to engage the clutches. Both the 15 and 20-ton cranes can be equipped with standard boom equipment including crane, clam and drag, the shipper shaft shovel and the backdigger booms.

Both sizes of crane are equipped with 45 or 50-foot booms for use with 1 and 1¼-yard clamshell buckets. Booms are in two sections with interchangeable boom heads and middle sections for various boom lengths. Other equipment, as shown in the accompanying illustration, includes 45-inch electric lifting magnet, excited by plug-in system or by a 7½ kilowatt generator belt driven from the crane motor. The 8-wheel double-truck car body is 24 feet 2½ inches long over the couplers. It is equipped with swivel outriggers and track clamps.

The car body has two travel speeds, 4.2 miles per hour and 2.1 miles per hour, in either direction. Gear ratio can be varied to give other than standard speeds up to 14 miles per hour for main line railroad work. It is equipped with two hand travel brakes as standard equipment. One operating on the travel mechanism of the superstructure, the other on the truck body. Through air line is provided for shipment on train. As extra equipment both straight and automatic air brakes can be supplied.

Industrial Locomotives Gasoline Powered

No. 99

Cincinnati Car Corp., Winton place, Cincinnati, is announcing its new line of gasoline-powered, gear-driven, industrial locomotives. Four starting and traveling speeds, both forward and backward, and a high ratio of engine horsepower per ton of locomotive, are provided. To insure long life and proper functioning, the engines are equipped with oil purifier, gasoline strainer, and temperature gage. A spray-pump primer is also provided to assist in starting. A large water capacity in an over-size radiator to afford cooling of the engine, is also incorporated in the design. Due to construction, and the fact that the clutch is enclosed in oil, it can be slipped severely, as is often necessary in starting loads, without any appreciable heating.

In the four-speed transmission provided, the speed changes are made through shifting clutches. A power take-off is also provided for auxiliary use, such as a winch or hoist. The

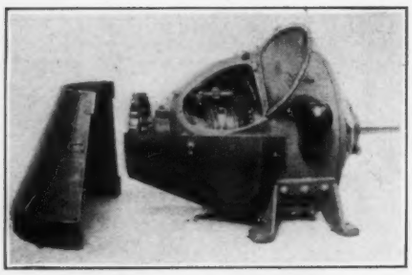
No. 98—Diesel-powered locomotive crane equipped with lifting magnet

heavy one-piece steel frame with large reinforcing ribs and struts provides a sturdy foundation. An electrically welded channel steel sub-frame carries the complete power plant, transmission and all operating parts as a unit assembly which is rubber insulated from the main frame to cushion it against shocks and jars. The drive wheels are located inside the main frame so that the axle bearings are on the ends of the axle. Effective hand brakes are provided with air brakes optional. The different models in this series are all built in a variety of sizes and track gages, and adapted for handling either industrial cars or railroad cars.

Switch Combines Three Control Devices

No. 100

General Electric Co., Schenectady, N. Y., announces a new switch which takes the place of the magnetic switch, motor circuit switch and enclosed fuses usually required in controlling the operation of a motor. This switch can be applied to control any motor where a general-purpose magnetic switch would be used, and where its special features are desirable. The switch consists of three sections: A back portion containing a motor circuit switch; a middle portion containing a base on the front of which the magnetic switch is mounted and on the back of which clips are provided for fuses; and the front cover. The back portion is built for mounting directly on a wall. No flexible connections are used between sections. A guard over the incoming line terminal prevents accidental contact when removing or substituting spare mechanisms. In addition, the switch cannot be removed from the back section unless the motor circuit



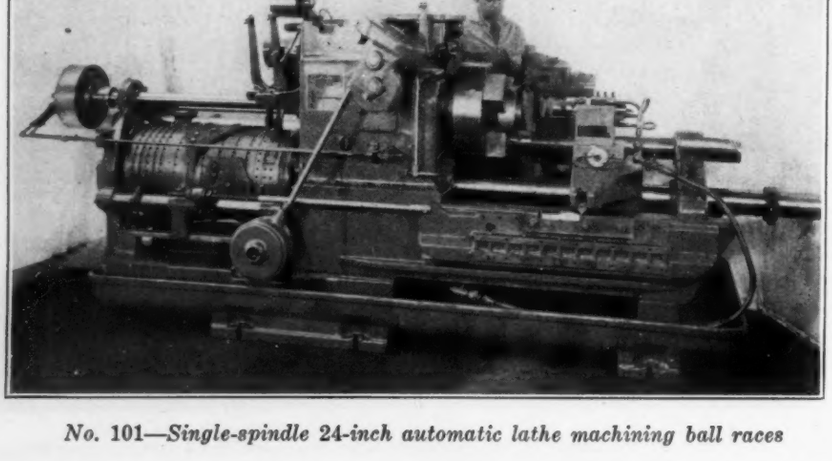
No. 102—Fan-cooled motor

switch is open. Overload protection is provided by two temperature overload relays which open the contactor when overloads occur. The relays are so designed that they will trip the contact mechanism just before the overload will cause the motor to be excessively heated. The switch is furnished with a holding interlock which permits its use with a "start-stop" momentary-contact, push-button station.

Single-Spindle Lathe is Built Larger

No. 101

Jones & Lamson Machine Co., Springfield, Vt., announces a larger model of its single-spindle automatic lathe. This machine is built in two 24-inch types; one for chuck work, and the other with a tailstock for work on centers. It is similar in construction to the standard automatic lathe but is heavier, larger and more powerful, and may be adapted to the machining of tractor parts, large automobile parts, flywheels, pipe flanges, large ball and roller bearing races, spur and bevel gears as well as miscellaneous parts. A complete line of tools and attachments has been designed for this new unit. This new machine swings 24½ inches which permits additional facilities for mounting tools and attachments, making it possible to finish more complicated pieces completely in one setting. The accompanying illustration shows one of these machines equipped with simple tooling for machine ball races in small size lots. The machine with a tailstock for use on centers has a length of bed that will take up to 24 inches on centers.



No. 101—Single-spindle 24-inch automatic lathe machining ball races

New Type of Fan-Cooled Motor Developed

No. 102

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces a new type totally-inclosed fan-cooled motor for direct-current applications. Standard type construction and parts are utilized in the unit, one of which is shown in the accompanying illustration. All mechanical parts with the exception of the shaft are interchangeable with those used on the present inclosed motor of the same frame size.

The cooling system does not interfere with the effectiveness of the motor inclosure. Bracket openings are closed with solid flat inclosing covers and gaskets. This type of construction permits the use of sleeve bearings and thus the motor is sealed from dust and fumes.

The commutator end is further inclosed with a sheet steel cover which has a perforated protective end through which the fan draws the cooling air that is directed over the bracket and passes out over the top of the unit, covering approximately three-quarters of the surface of the motor.

Depreciation Rates Are Debatable Question

(*Concluded from Page* 1192)

practice is to depreciate equipment in the manner most expedient to show profit or loss.

"The following rates are to be used in depreciating property through wear and obsolescence. They are used as a basis for computing manufacturing costs and exact profits, and are quite independent of the depreciation figures shown in the balance sheet. The figures given on the attached sheet hold good only for ordinary conditions. In cases where the property is subject to severe use and where there is a specially great danger that it may become obsolete through new inventions, considerably higher rates must be used. It is assumed that during its life the property will be given ordinarily good care. Repair and maintenance charges are to be kept separate from depreciation in computing

manufacturing costs for industries.

"The figures given in the first column of percentages are for an 8-hour working day. The lower or higher rates are to be used according to the service to which the equipment is subjected."

Type of property	Life in years day shift	Depreciation rates, per cent Day	Night
1 permanent factory buildings	50-25	2-4	3-5
Foundry buildings	25-20	4-5	5-6
Frame structures for steel works, etc.	33-20	3-5	3-5
Wooden structures according to type and quality	20-5	5-20	5-20
2 Boilers, piping, superheaters, preheaters, water purifiers, etc.	20-10	5-10	7-12
Steam engines	25-10	4-10	5-12
Internal combustion engines	20-10	5-10	7-12
Water wheels and turbines	17-12	6-8	8-11
Power transmission machinery	20-10	5-10	7-12
Belts and ropes	5-2	20-50	50-100
Gas and water piping (not subject to frequent renewal)	20-10	5-10	5-10
3 Heating equipment	25-10	4-10	5-12
4 Generators and motors	14-8	7-12	10-15
Lighting equipment, wiring	8-5	12-20	15-20
Storage batteries	8-5	12-20	15-20
5 Locomotives and cars	25-5	5-20	7-20
Tracks, switches, turntables	20-10	5-10	7-12
Cranes, hoists, elevators, coal handling machinery, etc.	15-10	7-10	10-12
6 Miscellaneous machinery, pumps, fans, etc.	20-10	5-10	7-12
7 Machine tools Automatic and precision tools	10-6	10-17	12-20
Other machine tools	14-10	7-10	10-12
8 Implements and hand tools except those quickly used up, which are figured in current costs	4-2	25-50	50-100
9 Blast furnaces, cupolas	14-10	7-10	7-10
Open hearth furnaces and kilns	5-3	20-30	20-30
10 Wood patterns	2-1	50-100	50-100
Metal patterns	3-2	30-50	30-50

In commenting on this report, E. F. DuBrul, general manager, National Machine Tool Builders' association, Cincinnati, says, "From Mr. Wallis' first paragraph it seems that most of the German business executives need as much education as some Americans need on depreciation accounting."

Construction Stabilizing All Business

The high rate of construction activities in the United States since 1922, averaging $7,000,000,000 annually, is regarded as a stabilizing influence on business generally in the survey of the national bureau of economic research made public as part of the report of the committee on recent economic changes of the President's unemployment conference.

The public utilities have provided the roots for this great building program, the committee found. Construction has become more national as to standards and more independent of local financial conditions. In design of structure and in construction methods a more general reliance has been placed on trained engineers. Trade associations and professional groups have contributed much toward technical advances, the committee states.

Metallography Explains Effects of Working

(*Concluded from Page* 1189)

the bottom of the thread of a broken bolt. This also holds true in punched and pressed parts. Fig. 184 shows the pronounced elongation of the crystals under a numbering die which was used to mark the material—line a-a corresponds to the surface of the piece. Without considering the reduction of the section due to the punching, the material at these places also becomes brittle from the great deformation of the crystals so that the fractures can easily begin there. This is proved for instance by the examination of a carbon dioxide tank, which burst when dropped. By chance it happened that the numbers had been marked at the thinest place of the wall and that point was near the thread. Due to the cold working and the resultant reduced resistivity to impact, the bursting occurred.[54] It is incomprehensible that even today, despite many accidents caused by this official notching, this senseless destruction of the material still continues.[55] Fig. 186 shows heavy notches on the neck of a hydrogen tank. This way of invalidating old marks by heavy chisel cuts is particularly dangerous.

[54]C. v. Bach, Zschr. d. Ver Deutsch, Ing, Vol. 56, page 704, 1912.

[55]Although M. v. Schwarz has pointed this out in a paper "Aus der Metallkundlichen Praxis," read on June 28, 1925 at the meeting of the Verbandes Dtscher, Diplom Ingenieure, published in *Technik und Kultur*, 1925, No. 11, and in *Der Metallgiesser*, Vol. 6, Nos. 2 & 4, almost with the same words, this government rule does not yet seem to have been changed.

Concrete Floors a New Reinforcing Market

(*Concluded from Page* 1191)

reinforced concrete first floors in residences is fire protection. It certainly is an important one, but I question whether the building public is particularly "fire conscious." If fire safety is to have a strong sales appeal, we must, through our advertising and other means, strive to awaken a keener appreciation of the fire danger.

If I were asked the principal sales reason for reinforced concrete first floors in a dwelling, my answer would be "low interior maintenance costs that come from rigid floor construction." The third strong sales reason for a reinforced concrete floor is high resale value. Reinforced concrete floors furnish a rigid, nonshrinking, durable structure upon which to set partitions that when plastered will remain free from cracks. These buildings at the end of 10 or 15 years, show few signs of use and the increased cost of the original concrete floor is lost many times over in the increased market value.

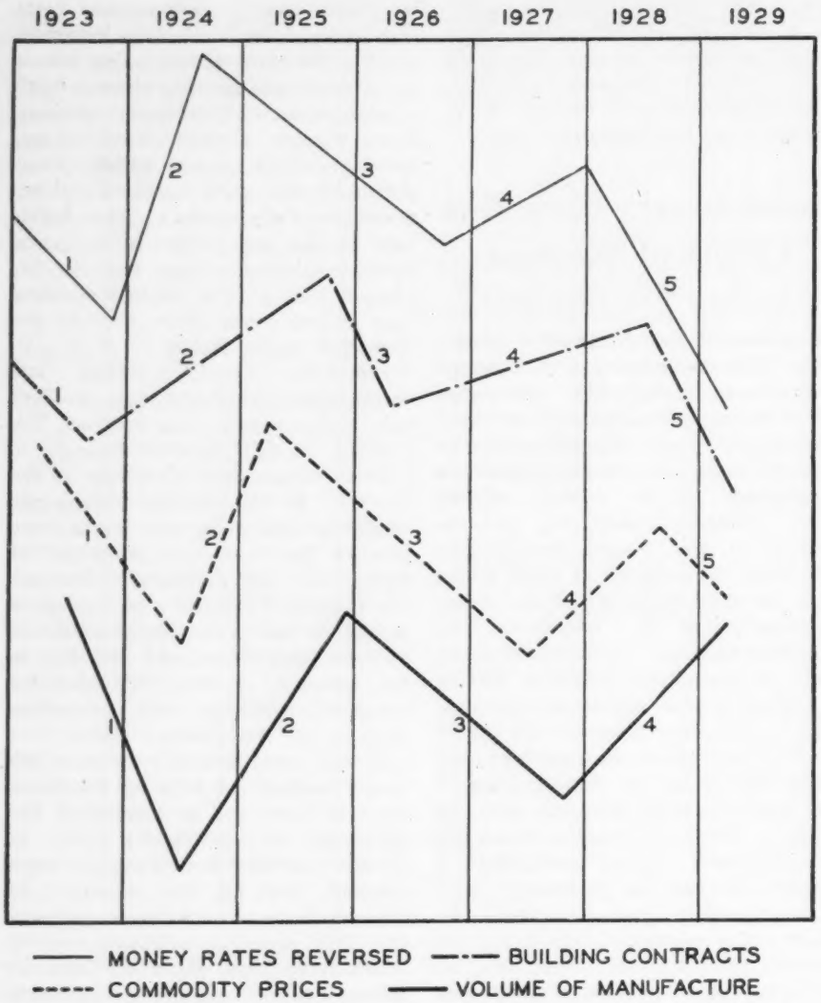
Protection against storms and earthquakes furnishes a most excellent sales advantage in many sections. The strength of any building depends to a great extent on the rigidity of the floors. In the Florida hurricanes many masonry walls were blown down because they were not cross-tied by rigid floors or partitions. Through the Central West, in what is known as the tornado zone, rigid reinforced concrete first floors add stability to the strength of the wall and the basement furnishes full protection, even in the most severe storm.

At the construction conference different methods of building reinforced concrete floors will be illustrated. Experiences of contractors will be studied and the best thoughts made available for all the others. An adapted form of our design and control of concrete mixture courses, which have been given for approximately 40,000 engineers, architects and large builders will be presented to the small contractors.

We are projecting our program on the basis of 5 years of promotion. We may find it necessary to increase this time. When we started our concrete products promotion in 1919, the program was laid out for 5 years. At the end of that period another 5-year program was started. During that time the output of concrete masonry in the United States has increased from less than 100,000,000 units a year to 384,000,000 units. The number of concrete products salesmen has increased in 4 years from 25 to over 400. I believe we have reason to be optimistic about the results of our reinforced concrete residence first floor program. Any business from this field is entirely new business.

Sales of Aluminum Industries Inc., Cincinnati, in the first quarter were 35 per cent over the similar quarter of 1928.

Will Volume of Manufacture Follow the Other Lines Down?



IN THE May issue of "Looking Ahead," a monthly statement of business prospects issued by Alvan T. Simonds, president, Simonds Saw & Steel Co., Fitchburgh, Mass., Mr. Simonds presents a chart in further support of his repeated prediction that a decline in industrial activity is imminent. The chart, which is reproduced on this page, shows trend lines for commercial paper rates (reversed), building contracts as reported by the F. W. Dodge Corp., wholesale commodity prices from the Harvard Economic society, and volume of manufacture as reported by that society.

Mr. Simonds shows that in each of these four indicators there have been four major movements as indicated by the numerals in the chart. In the case of money rates, building contracts and commodity prices a fifth movement started in 1928 and is continuing. It is his belief that the fifth major movement in volume of manufacture is bound to follow that of the other three indicators, just as it has done in the past.

Blast Furnaces Double Labor Productivity

The productivity of labor in the merchant blast furnace industry was more than twice as great in 1926 as in the prewar period 1912-1414. A summary of those plants covered by the bureau of labor statistics, Washington, shows that the average output of pig iron per man-hour of labor in the period 1912 to 1914 was 0.141 gross ton, while for the year 1926 the output was 0.296 gross ton. Or to state it another way, it required slightly more than 7 hours of labor time to produce a gross ton of pig iron in the prewar period as against 3 hours and 23 minutes in 1926. Preliminary figures for the first six months of 1927 for a limited number of plants indicates a still higher output, 0.30 gross ton, per man-hour.

One of the most important causes of the great improvement in output per man-hour has been the abandonment of many of the inefficient low-productivity plants. In 1921 the average output per man-hour in merchant blast furnaces was much higher than in the previous year because the depression forced out many of the weaker plants, leaving high-productivity plants in operation. During the prosperity of 1923 many low-productivity plants came back into the industry, but the keener competition of the steelworks blast furnaces since then has driven a great number of them out of business. Less than three-fourths of the merchant plants operating in 1923 remained active until 1926, and the high-productivity average of the latter year is due in no small degree to the closing down of inefficient plants.

Productivity has also been influenced by the substitution of machinery for labor. Another development in recent years, which has had an important effect on the number of men required to operate a blast furnace, is the substitution of the 8-hour day for the 12-hour day. Although three crews were required where two had been used before, the labor force was so reorganized in a majority of plants that very few more men were employed, while the total man-hours were actually reduced.

Rust Can Either Aid or Retard Corrosion

(*Concluded from Page* 1185)

viding the liquid is unstirred and neutral, belong to the second.

But either the presence of certain types of scale on the surface, or of chromium in the metal, or of film-repairing chemicals like potassium chromate in the water, or again motion of the liquid over the surface, tend to alter its behavior towards that of the first class. The position in the liquid is also of importance; a zinc surface tends towards the behavior of the first class if placed horizontally, and towards the second class if placed vertically.

Group life, sickness and accident insurance has been provided by Spang, Chalfant & Co., Pittsburgh, for employes of its Ambridge, Pa., works.

Editorials

Business Outlook Not Unfavorable

THE first four months of 1929 have brought a record of mountainous industrial activity. As the weeks roll by and the end of the first half approaches, business naturally is growing more concerned over what is in store in the last half of the year. This concern is emphasized by the fact that apparently the crest of spring activities has been passed.

Some seasonal slackening is to be expected. The rates of output and operations in large industries in the early months of this year could not be long maintained. Since no one expects this, the real question revolves about the extent of the coming decline from the peak. Will it be more than a normal adjustment?

So far indications within the industry itself have pointed to a mild contraction, but the disturbing state of the credit situation has transplanted the prospect into the realm of uncertainty. Money rates are high and many financial authorities believe a condition of inflation exists which, unless checked, bodes no good for business. This feeling has tended to have an unsettling effect upon business sentiment, although it is generally recognized that credit is not stringent in anything like the sense it was in 1920.

But the situation has a profoundly constructive side and so far this has weighed more heavily in the balance than the adverse consideration. In the first place, if there is inflation it has been elsewhere than in industry, chiefly the stock market. Commodity prices have not soared. There is no evidence that inventories have accumulated in excessive volume. Restricted credit has not checked any industrial activity other than residential building. Seasonal slackening in commercial credit needs should lessen the tension.

A recession in activity beyond a letdown of seasonal proportions does not seem in sight.

Concrete Bars Seeking New Market

MAKERS and distributors of reinforcing steel sight in the offing a new market for their product. With the Portland Cement association initiating an extensive campaign for reinforced concrete first floors in residences, an entirely new field is being entered. Admittedly, the purpose of the campaign is to expand the use of cement, but results as they may be attained will create a demand for concrete bars and other reinforcing shapes.

The use of reinforced concrete floors in office, commercial and factory buildings is common practice, but for the home it is almost unheard of, except perhaps in a limited number of costly and exclusive residences. It is now proposed through the medium of consumer advertising and educational conferences with architects and contractors to create a "concrete floor consciousness" in all home builders. It will be pointed out that in first cost the new floor construction will not have to compete with other types of construction, but in the long run it will prove more economical through superior wearing qualities.

According to the American Iron and Steel institute, production of concrete bars reached its peak in 1925 with 819,587 gross tons. In 1926 and 1927 the outputs were close to the record and while the figure for 1928 is not yet available, it is probable that a new production was established. There appears to be considerable room for expansion in the use of this structural product; thus steel mills and reinforcing engineers and distributors might well study the prospects of increased consumption.

Productive Capacity Is Increased

PIG iron making capacity of the United States was expanded 701,545 gross tons in 1928, steel ingot capacity increased 2,323,700 tons, while steel castings capacity was reduced 4411 tons. These facts have been announced by the American Iron and Steel institute which has just completed its annual survey of productive capacities. In arriving at the new figures as of Dec. 31, 1928, due consideration was made for capacity constructed and abandoned in the year.

That iron making capacity should show expansion may evoke some surprise in view of the fact that many blast furnaces were dismantled in 1928. But, it must be borne in mind that all of the stacks abandoned were small uneconomical units, while the relatively few stacks newly constructed were of large capacity. While no statistics are available, there can be no doubt that steelworks or nonmerchant interests are re-

sponsible for the increased capacity, with merchant interests showing a shrinkage.

As regards steel ingots, the unprecedented demand for steel last year encouraged the building of new capacity and expansion of old. The policy of a few steel products makers to manufacture their own steel also has been a factor in increasing productive capacity. It is to be recalled that in March a new all-time monthly production record for open-hearth and bessemer was attained, with an operating rate of 103.02 per cent, based on the capacity of Dec. 31, 1927. Using the new capacity figure as of Dec. 31, 1928, this operating rate is revised to 99.2 per cent, a rate which appears more reasonable. For the first quarter, operations have averaged 91.8 per cent, rather than 95.41 per cent.

Create Reservoir of Skilled Labor

CREATION of a reservoir of skilled labor through foremanship and apprenticeship training and general industrial education is being steadily developed by individual companies and through trade groups. At the recent convention of the National Metal Trades association in Chicago further important strides were shown to be advancing the scope of employe training sponsored by that association.

The scarcity of skilled workmen was reported as a problem that is being realized more sharply in many metalworking lines. Some hostility to employe and apprenticeship training has been expressed in the past, due to the feeling that open invitations thus may be offered to employers to absorb illegitimately each others' help. Fortunately, a more open-minded view is superseding that fear. Such concerted movements as the intelligent improvement of labor markets affect favorably the conditions governing many manufacturers in similar lines of enterprise, irrespective of their location.

Now Wins on Appearance

WHILE steel holds high rank among the materials widely used by man, its position in this regard has been won by its strength, ductility and many other useful physical properties rather than by its appearance. For many years a bare steel surface has been considered unsightly and it has been customary to paint or coat such surfaces.

Now there is a tendency to use alloy steels for a great variety of small steel parts, these alloys depending upon their own appearance rather than upon coatings or other protection or decorative treatment. Leaders in this field are the various stainless steels. A new chrome nickel alloy has just been developed and chromium alloys of various kinds are winning increasing recognition for their good appearance and corrosion resistance. Precision instruments such as gages, scales and meters are being made or coated with a chromium alloy to prevent corrosion and thus increase accuracy. Ship fittings and exposed airplane parts are being successfully made of chromium steel.

Dr. Donald C. Stockbarger, Massachusetts Institute of Technology, Cambridge, Mass., in a recent lecture pointed out many new uses for chromium. He said the world's supply of chromium ore exceeds that of copper. Undoubtedly steel's greatest usefulness will come through its linking hands with other metals for better looks.

Refractories Accept Challenge

PROGRESS in the production of iron and steel is due in an important degree to close cooperation between refractory engineers and metallurgists. Not many years ago metallurgists claimed that they were handicapped by failure of the refractory industry to engage in research work. Likewise refractory engineers were inclined to blame metallurgists for not meeting the conditions imposed by the properties of fire brick. Much of this criticism has been dissipated due not only to the excellent work of the large manufacturers of refractories during the last few years, but also to a more co-operative spirit on the part of iron and steelworks metallurgists and operators. New refractories have been developed and new materials such as chrome and magnesite have been tried with marked success. Modern laboratories have been created.

Results already achieved are of great importance. They include the discovery of the catalytic action of iron oxide in promoting carbon deposits within the bricks of blast furnace linings. This deposit is a frequent cause of the disruption of the bricks with the resultant failure of the lining. Having discovered the cause it was not difficult to eliminate catalysis and thus correct the difficulty. Manufacturers have devised new methods of producing brick which make for greater uniformity in size and higher density.

The progress already accomplished by refractories research departments should be recognized. Whatever the ground for former criticism, the fact is now established that leading refractories manufacturers are doing their share. All possible encouragement should now be given for further study and development in this field which is of broad importance to the iron and steel industry.

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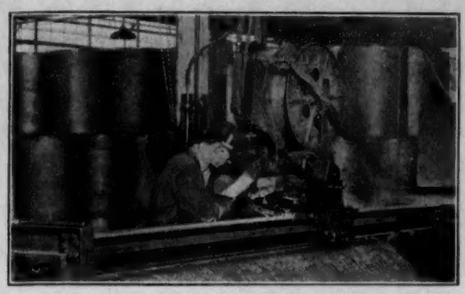

New Uses Found for Welding Processes. Page 1225.

INDUSTRY is giving more attention to developing new ideas, and less to labor disputes. A reflection of this is apparent in extensive reports in this issue of conventions of three national organizations in the past week, National Metal Trades association, American Welding society and Concrete Reinforcing Steel institute. The metal trades association reports labor discord at the lowest stage of many years. The reinforcing institute is interested in new markets, such as use of concrete first floors in homes. Broader applications are being found for welding. Constructive energies predominate.

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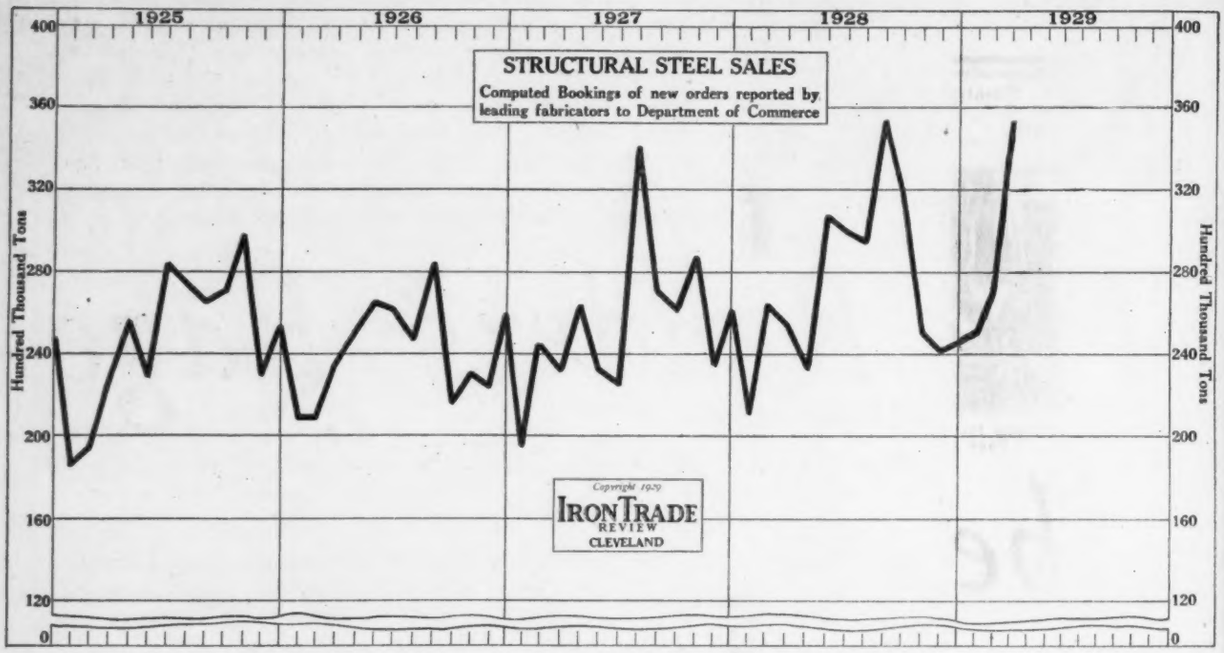
The Business Trend



Industrial Records Impressive

By JOHN W. HILL, Financial Editor

FURTHER evidence that all vitality has not entirely disappeared from the construction industry is found in the record of structural steel awards in March. New orders for fabricated structural steel during that month increased by 35 per cent, compared with the corresponding month of 1928. In general, it has been assumed that building this year was lagging behind that of one year ago. However, this has applied chiefly to residential building.

COMPUTED tonnage of new orders, as shown by the accompanying chart, amounted to 358,050 tons in March. This compared with 269,500 tons in February and 257,650 tons one year ago. The total for the first quarter was 900,900 tons against 731,500 tons in the first quarter of 1928. Shipments in March were 72 per cent of capacity, against 59 per cent one year before.

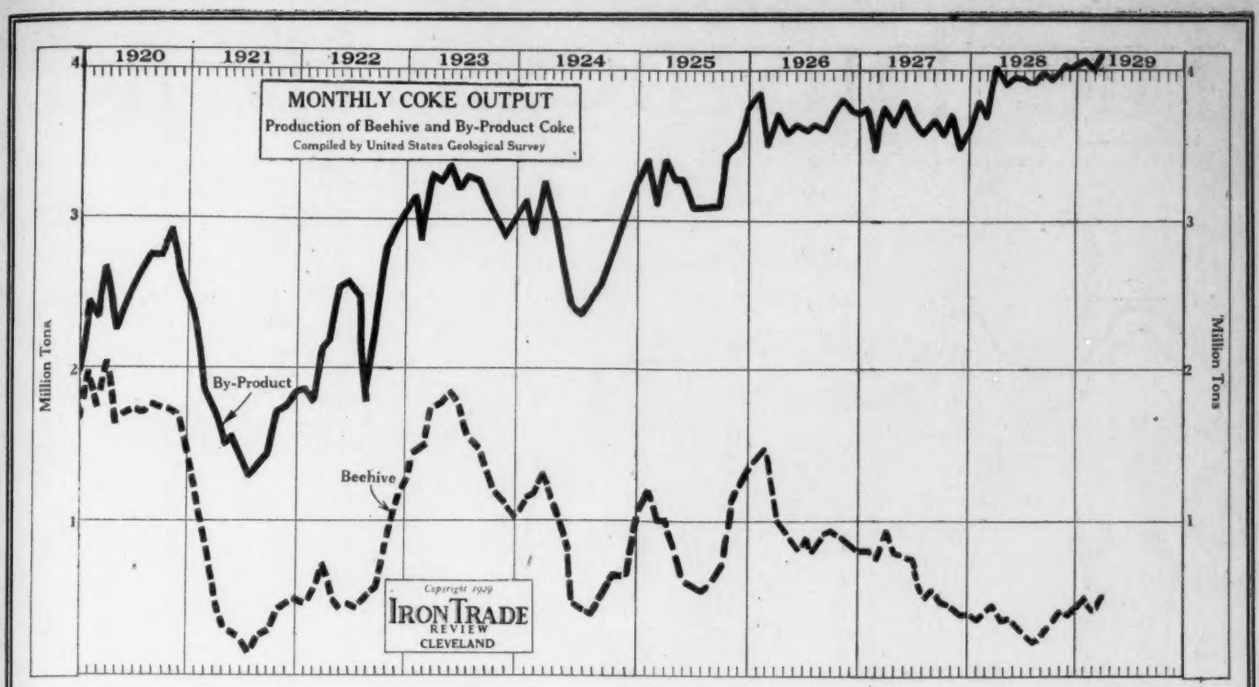
ANOTHER industrial record of considerable interest is that of steel castings bookings. These rose in March to the best level in five years. New orders for commercial steel castings during the month were 89 per cent of capacity, compared with 79 per cent in February and with 59 per cent in March one year ago.

THE credit situation continues as the puzzle of the year. Last week stock exchange call money soared again to abnormal levels, this time reaching 16 per cent. No one seemed to know just why this happened. Examining the credit structure, it is found that brokers loans have declined. Moreover, the federal reserve ratio has climbed to 74 per cent, and federal reserve credit outstanding of $1,281,000,000 actually is $100,000,000 less than it was one year ago.

THE stock market has had alternate spells of strength and weakness as sentiment fluctuates with regard to credit. Meanwhile, the feeling is growing that the most acute phase of the credit situation has passed, and that henceforth there should be some ease. Commercial credit needs are likely to undergo some seasonal slackening as activities recede from the recent peaks.

ONE factor which is causing stock market strength in certain groups of stocks notwithstanding the money situation is that of earnings. In this respect the iron and steel industry has attracted particular attention, because of the favorable profit showing during the first quarter of the year.

The Business Trend

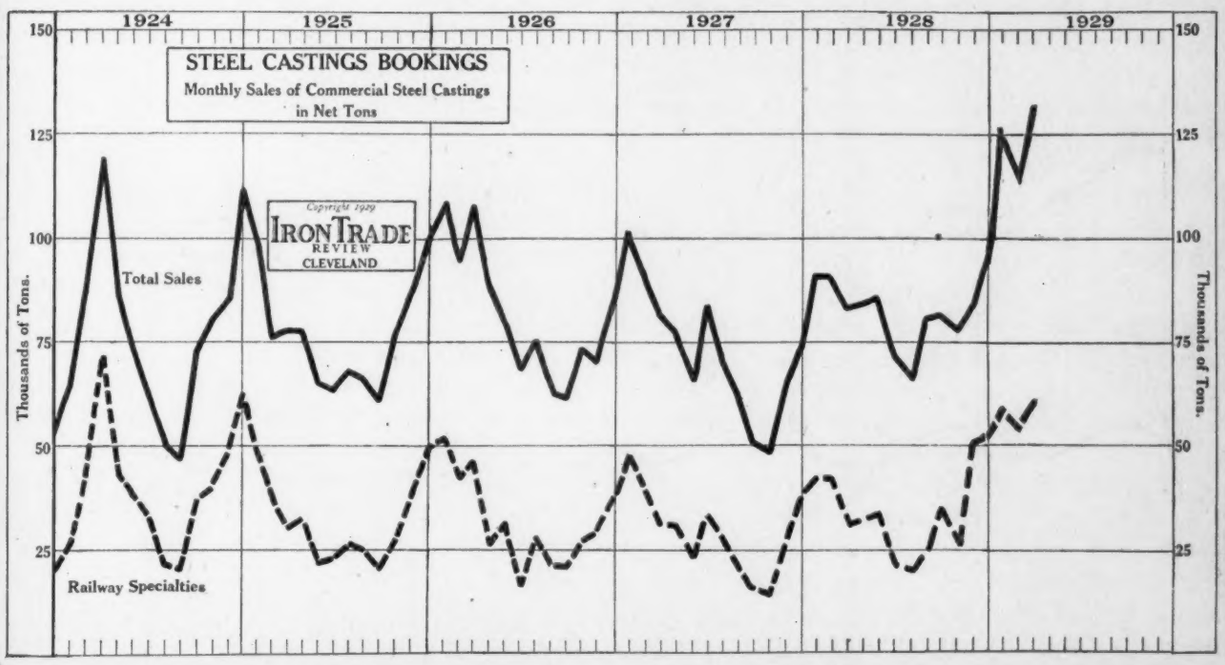


Coke Production

PRODUCTION of by-product coke in March was the highest in the history of the industry, reflecting the extraordinary outputs of iron and steel. By-product coke production for the month was 4,613,075 tons, compared with 4,089,710 tons in February and 4,064,940 tons in March one year ago. The daily average production was 148,809 tons, compared with 131,127 one year before. Production of beehive coke in March was 533,500 tons, compared with 440,200 tons in February and 449,400 tons in March, 1928.

Steel Castings

NEW orders for commercial steel castings in March reached the highest rate since March, 1924. Bookings as reported to the department of commerce represented 89 per cent of capacity, compared with 79 per cent in February and 57 per cent one year ago. Total tonnage placed during the month was 130,271 tons, compared with 115,639 tons one month before and 83,755 tons one year ago. Railway specialty orders increased from 58,900 tons to 60,000 tons, reflecting more activity in railroad equipment industry.



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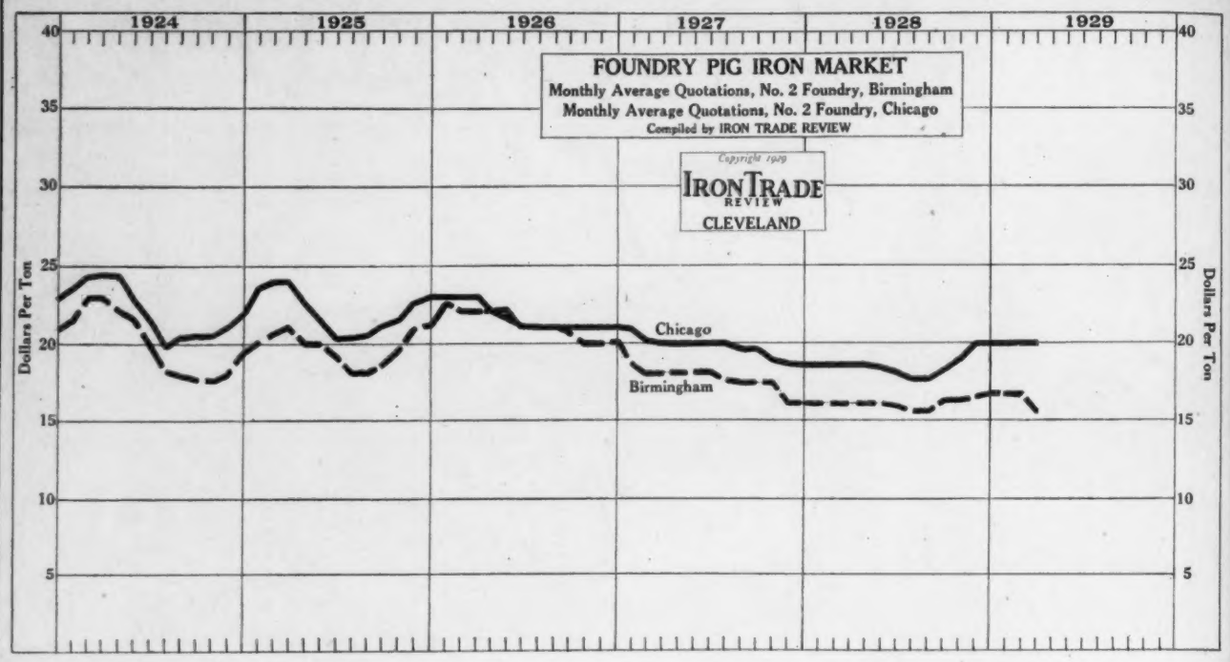
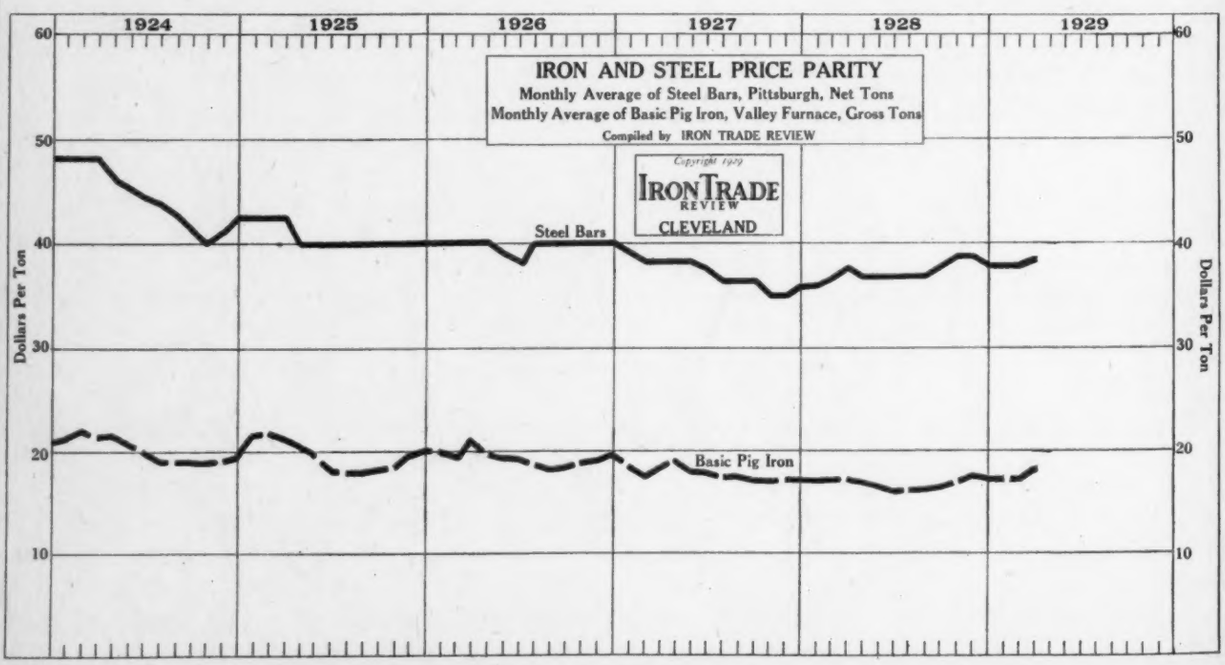


Foundry Pig Iron

THE foundry pig iron market continues to be featured by weakness in the price of the southern product. Southern No. 2 Birmingham stood at $15.50 a ton during April, compared with $16 in March and $16.50 a ton at the beginning of the year. In contrast with this weakness in the South, northern iron has remained firm. No. 2 foundry Chicago continued at $20 a ton during April, a figure that has held unchanged since the advance began late in 1928. Firm prices for northern iron reflect activity.

Steel Price Parity

MARKETS for both finished steel and basic pig iron have shown firmness during the past month. The average for steel bars in March was $38 a ton and in April this was marked up to $39 a ton, a quotation which continued throughout the month. Basic valley iron after its protracted spell of weakness, displayed further strength during April with the quotation averaging $18 a ton. This compared with $17.50 a ton in March, $17.50 in January and $16.75 one year ago.



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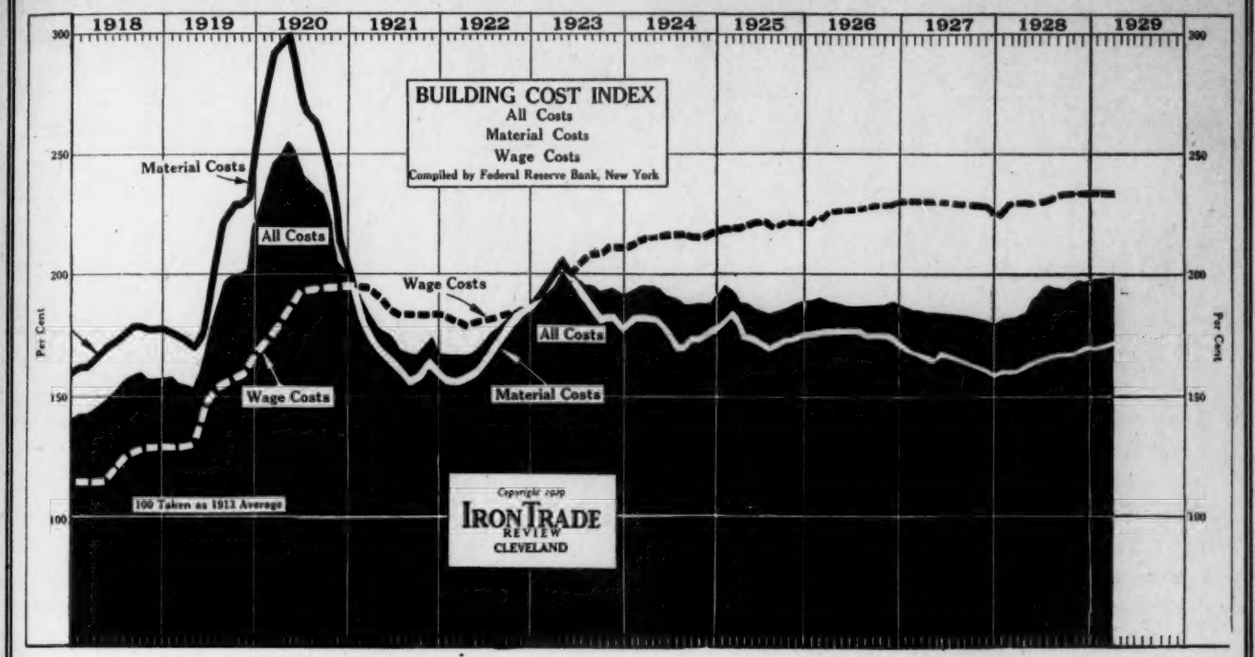
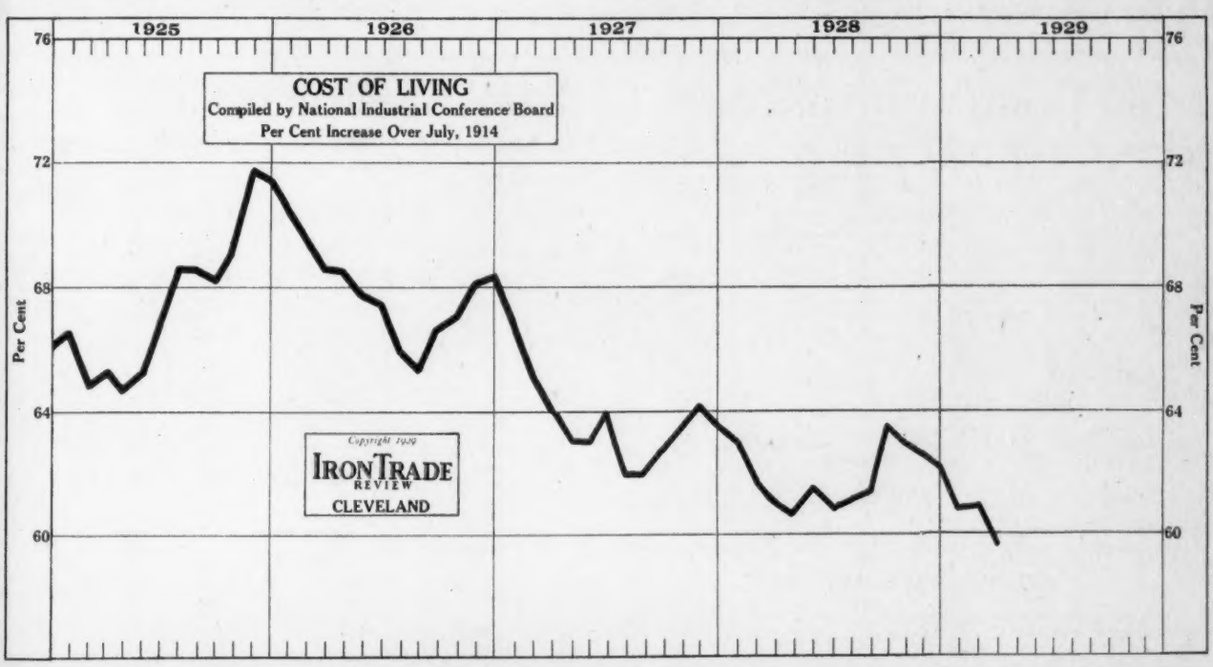


Building Cost

THE rising tendency of building costs apparently came to a halt during the spring. The index of the cost of building compiled by the federal reserve bank of New York for March stood at 194. This was unchanged from the index for the preceding month and compared with 186 one year ago. Building materials stood at an index of 168, the same as applied for February and compared with 157 one year before. Material prices have been rising rapidly during the past year until recent weeks. Wages of building labor continue at 233.

Cost of Living

THE gradual decline of retail prices as measured by the cost of living index of the National Industrial Conference board continued to be in evidence during March. The index stood at 159.8, compared with 161 one month before. Clothing prices for the country reached the lowest point since 1925 and stood at 1.7 per cent below the prices prevailing at the beginning of the year. Food also has declined. Purchasing power of the dollar, which increases as the cost of living decreases, rose to 62.6 cents as compared with 48 cents in 1920.



April Iron Output Almost Record

Daily Rate and Total Just Below Peak April, 1923—Steelworks Continue at Capacity—Plate Demand Heavy—Ore Shipments Outrun 1928

PIG iron production declined fractionally in April, but the net gain of three active stacks in the month may presage a comeback in May. Preliminary estimates place the April daily rate at 118,154 gross tons, compared with 119,662 tons in March and 106,066 tons last April. So close is last month's rate to the record for April—118,210 tons in 1923—that final figures may establish an April record.

Four-Month Iron Output Unexcelled

April total production is estimated at 3,544,620 tons, compared with 3,709,518 tons in March, which was a longer month, and 3,181,975 tons last April. The four-month output of 13,905,542 tons is a record for the period. In April eight steelworks stacks were blown in and four were blown out; two merchant stacks were dropped and one was lighted. The 216 stacks active as of April 30 was the greatest number since April, 1927.

In steel the trend in buying continues moderately downward, with the Chicago district, for several weeks an exception, now in line on some products. But so insistent is the pressure for prompt steel and so wide is the gap between booking and shipping, especially on bars, plates, sheets and strip, that this tendency is scarcely reflected in production and the mills have never entered a May with operating rates so high.

Shortage of semifinished steel continues to handicap finishing mills at Pittsburgh, Chicago and Youngstown, the recent advances not bringing out additional supplies. Chicago continues to draw plates from Cleveland and Buffalo and forging bars from Pittsburgh. Water shipments to Detroit are expanding. In the East, deliveries generally are easier.

Semifinished Steel Prices Still Rising

Considering all districts, iron and steel prices are strong. Pig iron producers in the valley district continue to apply their recent advances on the current small sales. More lower lake iron than reported appears to have been sold in the Chicago district, but without weakening the Chicago market. Iron and steel scrap prices tend toward softness. Sheet bars at Chicago and

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	May 1, 1929	April 1929	Feb. 1929	May 1928
PIG IRON				
Bessemer, del. Pittsburgh	$20.26	20.26	19.86	19.26
Basic, valley	18.00	18.00	17.50	16.20
Basic, eastern, del. eastern Pa.	20.65	20.25	20.50	19.10
No. 2 foundry, del. Pittsburgh	20.26	19.86	19.26	18.86
No. 2 foundry, Chicago	20.00	20.00	20.00	18.20
*Southern No. 2, Birmingham	15.50	15.50	16.50	16.00
**No. 2X, Virginia furnace	20.75	20.75	21.25	20.50
**No. 2X, eastern del. Phila.	22.76	22.26	22.01	21.26
Malleable, valley	18.50	18.50	18.00	17.25
Malleable, Chicago	20.00	20.00	20.00	18.20
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	19.26	19.26	18.76	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	109.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville furnace, ovens	2.75	2.75	2.90	2.55
Connellsville, foundry, ovens	3.75	3.75	3.75	3.55
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	35.00	34.25	33.10
Sheet bars, open-hearth, Pittsburgh	36.00	35.25	34.25	33.50
Billets, open-hearth, Pittsburgh	36.00	34.50	33.25	32.50
Wire rods, Pittsburgh	42.00	42.00	42.00	44.00

	May 1, 1929	April 1929	Feb. 1929	May 1928
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.95	1.90	1.85
Steel bars, Chicago	2.05	2.05	2.00	2.00
Steel bars, Philadelphia	2.27	2.27	2.27	2.17
Iron bars, Chicago	2.05	2.05	2.05	2.00
Shapes, Pittsburgh	1.95	1.95	1.90	1.85
Shapes, Philadelphia	2.00	2.06	2.01	2.08
Shapes, Chicago	2.05	2.05	2.00	2.00
Tank plates, Pittsburgh	1.95	1.95	1.90	1.85
Tank plates, Philadelphia	2.15	2.15	2.10	2.05
Tank plates, Chicago	2.05	2.05	2.00	2.00
Sheets, black, No. 24, Pittsburgh	2.95	2.90	2.85	2.75
Sheets, blue anl., No. 10, Pittsburgh	2.20	2.15	2.10	2.00
Sheets, gal., No. 24, Pittsburgh	3.70	3.65	3.60	3.65
Sheets, black, No. 24, Chicago	3.10	3.10	3.00	2.85
Sheets, blue anl., No. 10, Chicago	2.35	2.35	2.25	2.20
Sheets, galvanized, No. 24, Chicago	3.85	3.85	3.75	3.80
*Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
*Wire nails, Pittsburgh	2.65	2.65	2.65	2.60
Tin plate, per base box, Pittsburgh	5.35	5.35	5.35	5.25
*To large jobbers.				
SCRAP				
Heavy melting steel, Pittsburgh	18.00	18.50	18.60	15.00
Heavy melting steel, eastern Pa.	16.50	17.00	16.30	13.75
Heavy melting steel, Chicago	15.75	17.00	16.25	12.95
No. 1 wrought, eastern Pa.	16.25	16.25	16.25	15.25
No. 1 wrought, Chicago	16.50	16.65	15.75	13.05
Rails for rolling, Chicago	17.50	17.50	17.50	14.35

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND

STEEL PLATES

Pittsburgh, base	1.95c
Philadelphia, del.	2.15c to 2.25c
New York, del.	2.225c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.14c
Lackawanna, N. Y., base	2.05c to 2.15c
Birmingham, base	2.10c to 2.20c
Coatesville, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
St. Louis, del.	2.27c
Detroit, del.	2.19c to 2.24c

STRUCTURAL SHAPES

Pittsburgh, base	1.95c
Philadelphia, base	2.00c to 2.11c
New York, del	2.195c to 2.245c
Boston, del.	2.265c to 2.415c
Chicago, base	2.05c to 2.15c
Cleveland, delivered	2.14c
Lackawanna, N. Y.	2.05c to 2.15c
Birmingham, base	2.10c to 2.20c
Bethlehem, Pa., base	2.00c to 2.15c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.19c to 2.24c

BARS

SOFT STEEL

Pittsburgh, base	1.95c
Chicago, base	2.05c to 2.15c
Birmingham, base	2.10c to 2.20c
Lackawanna, N. Y., base	2.05c to 2.15c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.95c
Cleveland, del., outside mills	1.95c to 2.00c
Philadelphia, del.	2.27c to 2.37c
New York, delivered	2.29c to 2.39c
Boston, delivered	2.265c to 2.415c
Detroit, del.	2.19c to 2.24c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	2.05c to 2.15c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.30c
Stock lengths from mill	2.00c
Chicago, billet	2.35c to 2.40c
Chicago, rail steel	2.00c to 2.05c
Chicago, rail steel, road and bridge work	1.95c to 2.05c
Philadelphia, cut lengths	2.57c to 2.62c

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh, base	2.85c to 2.95c
No. 24, Philadelphia, delivered	3.17c to 3.27c
No. 24, Gary, Indiana Harbor	3.05c
No. 24, Chicago, delivered	3.10c
No. 24, Birmingham, base	3.10c
No. 24, St. Louis, del.	3.27c
No. 24, Pacif. coast ports, c.i.f.	3.50c

TIN MILL BLACK

No. 28, Pittsburgh, base	3.00c
No. 28, Gary, base	3.10c

GALVANIZED

No. 24, Pittsburgh, base	3.60c to 3.70c
No. 24, Philadelphia, delivered	3.92c to 4.02c
No. 24, Gary, Indiana Harbor	3.80c
No. 24, Chicago, delivered	3.85c
No. 24, Birmingham, base	3.85c
No. 24, St. Louis, del.	4.02c
No. 24, Pacif. coast ports, c.i.f.	4.25c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.10c to 2.20c
No. 10, Philadelphia, delivered	2.42c to 2.52c
No. 10, Gary, Indiana Harbor	2.30c
No. 10, Chicago, delivered	2.35c
No. 10, Birmingham, base	2.35c
No. 10, St. Louis, del.	2.52c
No. 10, Pacif. coast ports, c.i.f.	2.725c

AUTOMOBILE

No. 20, Pittsburgh, base	4.10c
No. 20, Detroit, delivered	4.39c

FURNITURE

No. 24, Grade A, Pittsburgh	4.20c

(Turn to the following page)

billets at Philadelphia are up $2. Finished steel prices generally are steady. Some sheets have been sold for third quarter delivery with price to be determined later.

A measure of plate activity is the fact that since December carbuilders at Chicago have taken 900,000 tons, including some bars and light shapes, while a Milwaukee fabricator of welded pipe has required 800,000 tons. On some sizes Chicago plate mills can deliver no sooner than 16 weeks. Two steamers at New York call for 24,000 tons. Backlogs of Pittsburgh plate mills lengthened in April.

Alloy steel bars appear to have suffered more than soft steel bars in whatever curtailment has taken place in automotive buying. Business of bar makers varies according to their automobile-buying affiliations. Demand for bars at Chicago has been less spirited, though deliveries continue as distant as 13 to 16 weeks.

Sheet Requirements Not Shrinking

Over their range of products sheetmakers note no marked variation in demand. Specifications for the higher finishes are substantially as heavy for May as they were for April delivery. Strip mills at Pittsburgh have cut down their backlogs slightly, but at Chicago cold strip needs exceed shipments. Farm country buying of wire products has exceeded expectations and jobbers' orders have been expanding. Carbuilders are taking as much steel as makers of plates and light shapes can ship them. With the Chicago & North Western likely to defer action on its inquiry for 2500 cars, approximately 6300 freight and 200 passenger cars are now pending, requiring in all 150,000 tons of steel. The week's awards include 500 by the Norfolk & Western and 150 by Northern Refrigerating Co.

Structural Awards Double Week Ago

Structural steel awards in the past week approximated 71,800 tons, compared with 33,000 tons last week and a weekly average of 41,700 tons for 1929 to date. New York subways have taken 16,000 tons, and electrification work of the Pennsylvania railroad 6600 tons. Bids on fabricated and erected structural steel are competitive.

Subsidiaries of the United States Steel Corp. are operating this week at 100 to 103 per cent of practical capacity. It is noteworthy that of the eight steelworks blast furnace stacks lighted in April, six were at Corporation plants and no Corporation stack was blown out. Independent producers are averaging close to 99 per cent this week. Chicago district operations have rebounded to 98 per cent but necessary repairs threaten.

Rarely has an iron ore season on the Great Lakes got under way so swiftly. It is estimated that from 1,500,000 to 2,000,000 tons was shipped in April, contrasted with only 5946 tons last April.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (May 1, 1929)	$37.07
Last week (April 24, 1929)	37.04
One month ago (April, 1929)	36.81
Three months ago (February, 1929)	36.28
One year ago (May, 1928)	35.54
Ten years ago (May, 1919)	48.29
Fifteen years ago (May, 1914)	22.99

Higher prices on pig iron in eastern Pennsylvania have lifted the IRON TRADE REVIEW composite of fourteen leading products 3 cents this week, to $37.07, the highest point for this index in 28 months.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted On Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	2.00c
Hot strip 6¼ to 24-in., Pitts.	1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c plate basis, or 2.10c blue annealed basis.	
Hot strip, bands 6 in. and under, Chicago	2.10c to 2.30c
Do, 6¼ to 24 in.	2.00c to 2.10c
Cooperage stock, Pittsburgh	2.20c
Do, Chicago	2.30c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 ton and over)	2.75c to 2.85c
Worcester, Mass. (3 tons and over)	3.10c to 3.20c

ALLOY STEEL

Hot Rolled

F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds squares)	0.50	3.15

COLD FINISHED STEEL

Cold finished steel bars drawn or rolled, Pitts., Chi., c.l.	2.30c
Do, del. Detroit	2.575c
Shafting (turned, polished) Pittsburgh	2.30c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.65c to 3.10c
Cold finished steel bars, Cleve.	2.25c to 2.35c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland, Ironton base

(Per pound)	Dealer trade	Large jobbers
Bright plain wire, 6 to 9 gage	2.60c	2.50c
Annealed field wire	2.75c	2.65c
Galvanized wire	3.20c	3.10c
Barbed wire, galvanized	3.40c	3.30c
(Per 100-pound keg)		
Wire nails	$2.75	$2.65
Galvanized nails	4.75	4.65
Polished staples	3.20	3.10
Galvanized staples	3.45	3.35
Cement coated nails	2.75	2.65
Manuf. wire, del. Detroit		2.735c
Wire nails, del. Detroit		$2.885

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland-Ironton base on products made there; Duluth $2 higher; Worcester, Mass., Fairfield, Ala., $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

Anderson, Ind., $1 higher, Chicago $2 higher, Duluth, Birmingham $3 higher.

CUT NAILS, CHAIN PILING

Cut nails, c.l., f.o.b. mills	2.70c to 2.75c
Cut nails, l.c.l. f.o.b. mills	2.80c to 2.85c
Chain, 1-in., proof coil, Pitts.	6.00c
Sheet piling, base, Pittsburgh	2.25c

CAST IRON WATER PIPE

Prices per net ton

Class B pipe

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Four-inch, New York	41.80 to 43.80
Six-inch and over, New York	38.80 to 40.80
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20 gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.35

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24.. 4.00c to 4.10c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Lock: to dealers	85-5 off
Lock: to consumers	85 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 29.00
Light rails, 25 to 45, mill	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand, jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	$43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.	
Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts-Cleve.	3.10c
Structural, c.l. Chicago	3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$36.00
Pittsburgh, bessemer	36.00
Youngstown	34.00
Cleveland	34.00
Philadelphia	39.30 to 41.30
Chicago	35.00 to 37.00
Forging, Chicago	40.00
Forging, Pittsburgh	41.00
Forging, Philadelphia	44.30 to 46.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00
Cleveland	35.00
Chicago	37.00

SLABS

Pitts., Young., and Cleve.	$36.00

WIRE RODS

Pittsburgh, Cleveland	$42.00
Chicago	43.00

SKELP

All grades, Pittsburgh	1.90c to 1.95c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range nonbessemer, 51½%	4.65
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.50
Mesabi nonbessemer, 51½%	4.50
High phosporus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%	8.00
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN ORE

Cents per unit, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese	10.50 to 11.00
North African low phosphorus	11.50 to 11.75
Swedish foundry or basic, 65%	9.00 to 10.00
Spanish and North African basic, 50 to 60 per cent.	10.00 to 11.00
Newfoundland foundry, 55%	8.50 to 9.00
Tungsten spot and early fut., short ton unit, duty paid	15.00 to 15.25

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian	34 to 36 cents
Indian	34 to 36 cents
Caucasian, (53-55 per cent)	36 to 38 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east. tide., gross ton	$20.15

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK

Net ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Pig Iron

New Business Quieter, with Shipments Continuing on Large Scale—Furnaces Taking Third Quarter Orders at Present Levels

APRIL, the first month of the second quarter, continued the high shipping record for pig iron noted in March, and furnace interests with heavy order books for May and June do not anicipate much if any recession during those months. Third quarter business is developing slowly in most districts, as more makers indicate a willingness to close for that period at present figures. Lower coke prices are a factor mentioned by consumers for not buying too far ahead at this time. Despite this sentiment, however, substantial orders for third quarter have been placed recently with lake furnace interests, from Chicago to Buffalo. The recent advance of 50 cents in valley prices have not been fully tested, and no further changes have been noted in other districts.

PITTSBURGH, April 30.—Pig iron consumers are taking slight interest in third quarter requirements, or for additional material over the remainder of the second quarter. Sellers, however, see indications that supplementary tonnage will be necessary to tide users over May and June, in view of steady shipments against contracts. Recent buying has been limited mainly to small tonnages, with sales of some grades too restricted to test the higher prices announced recently. Sellers report no difficulty in obtaining $18.50, valley, for No. 2 foundry iron. One 500-ton lot of bessemer was closed at $19, valley. Sales are lacking to test the $19 malleable price, or $18.50 on basic.

Boston, April 30.—Pig iron is firmer. Two Buffalo furnaces are out of the market, while two others offer only a limited tonnage. Because of the Buffalo situation the Mystic Iron Works has the market to itself, and sold about 1500 tons during the week. All sales were equivalent to $19, base, Buffalo. Some small sales of foreign iron were noted at $22.25 to $22.50, on dock, duty paid. An inquiry for 2000 tons of No. 1X iron for third quarter is pending.

New York, April 30.—The pig iron market is quiet. Sales in the past week to consumers in this territory do not appear to have aggregated over 5000 tons. New inquiry is small. While there is not much of a test, foundry iron seems to be firm at $19, base, Buffalo furnaces, equivalent to $22.28 to $23.91, delivered in this territory, depending on freight rate. Shipments on contracts continue active, although some foundries have requested postponements.

Buffalo, April 30.—Inquiry for pig iron and sales are small. Pressure for shipments has kept furnaces busy. Rumors of lower prices in the East are heard here, but are attributed to canal tonnage in which the delivered price, including a considerable saving on freight, has been figured back to Buffalo furnaces by all-rail tariffs. Small lots of iron for this district are bringing $19.50 for low silicon foundry and $20 for malleable.

Youngstown, O., April 30.—Sales of pig iron in this district continue small, but prices appear firmer. Some carloads of No. 2 foundry have been sold at $18.50, valley. A small tonnage of basic iron has been closed at $18, on a quotation outstanding prior to the last price advance. Basic is quoted today by leading local makers at $18.50. Several small lots of standard bessemer have been sold at $18, valley, but it appears this iron is sand cast, equivalent to $18.50 for machine cast. Other bessemer producers have been asking and getting $19, valley.

Cleveland, April 30.—Favorable conditions continue to prevail in pig iron, though not much change is noted from week to week as the market is in between two buying movements. Sellers anticipate a good volume of business this summer. Sales of furnace interests with headquarters in Cleveland totaled 23,000 tons the past week, compared with 16,000 tons in the week preceding. A considerable proportion of this was for third quarter, one or two makers selling for that period on the basis of present prices. More interest is shown by some melters in third quarter, and two inquiries, one for 2000 tons and another for 3000 tons for that delivery are pending. The daily rate of shipments in April averaged closely to that of March. Though the valley market is firm at $18.50, base, Cleveland furnaces have not advanced prices, and are not likely to do so until demand is more active than it is today. Their prices are $18.50, base, furnace, for outside shipment, and $19, base, for local consumption. Other lake furnace prices are unchanged.

Cleveland furnace interests did not figure in the American Steel Foundries' inquiry for a round tonnage of basic iron for its Alliance, O., plant, and the order, if placed, is thought to have gone to a valley producer.

Detroit, April 30.—Melting rates at foundries still are high, especially among those making automobile castings. No recession is expected before June or July. Shipments against contracts are accordingly heavy and occasional filling-in tonnages of single carloads up to as high as 600 tons at a time are bought by customers who did not contract or who underestimated requirements. Spot prices are unchanged at $20.50, Detroit furnace, for No. 2 foundry and $21 for malleable.

Chicago, April 30.—Third quarter pig iron tonnage sold in this district is running into substantial figures. Several large melters have bought into October and for the remainder of the year. Slowing down of sales by Chicago furnaces due to the opening of lake navigation is said to be negligible. Little cargo iron has been sold recently. An eastern lake furnace is said to have placed about 2000 tons direct. A cargo of English low phosphorous iron for delivery in the Milwaukee district is reported enroute for Great Lakes shipment by way of

(*Concluded on Page* 1221)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$18.50 to 19.00
Bessemer, del. Pittsburgh	20.26 to 20.76
Basic, valley furnace	18.00 to 18.50
Basic, del. Pittsburgh	19.76 to 20.26
Basic, Buffalo furnace	17.50
Basic, del. eastern Pa.	20.65 to 21.00
Malleable, valley furnace	18.50 to 19.00
Malleable, del. Pittsburgh	20.26 to 20.76
Malleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buffalo furnace	20.00
Malleable, del. eastern Pa.	22.76 to 24.40
Malleable, Granite City fur.	20.50
No. 1 foundry, Chicago furnace	20.50
No. 1X, eastern del., Phila.	23.26
No. 1X, Buffalo furnace	21.00
No. 2 foundry, valley furnace	18.50
No. 2 foundry, del. Pittsburgh	20.26
No. 2 plain, Buffalo furnace	19.50
No. 2 foundry, Chicago furnace	20.00
No. 2 fdy. Cleve. fur. for local del.	19.00
No. 2 plain, del., Phila.	22.26
No. 2 plain, Virginia furnace	20.75
No. 2 plain, Buffalo, del. Boston	22.91 to 23.91
No. 2 plain, N. J., tidewater	22.28 to 22.78
No. 2 Alabama, Bir. base	15.00 to 15.50
No. 2 Tenn., Birmingham base	15.50
No. 2 Tenn., del. Cincinnati	19.19
No. 2 Alabama, del. Cincinnati	18.69 to 19.19
No. 2 Alabama, del., Chicago	21.51
No. 2 Alabama, del., Cleveland	21.76
No. 2 Alabama, del. St. Louis	19.92
No. 2X, east, N. J., tidewater	22.78 to 23.28
No. 2X, eastern, del. Phila.	22.76
No. 2X, foundry, Buffalo furnace	20.00
No. 2X, Buffalo, del. Boston	23.41
No. 2X, Virginia furnace	20.25 to 20.75
Gray forge, val., del. Pittsburgh	19.76
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.26 to 24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	24.10 to 24.60
No. 2 foundry, del. Montreal	25.50 to 26.00
Malleable, del. Toronto	24.10 to 24.60
Malleable, del. Montreal	25.50 to 26.00
Basic, del. Montreal	24.50 to 25.00

Silvery iron, Jackson county, O., furnaces, in per cents: 5—$23 to $24; 7—$25 to $26; 8—$26 to $27; 9—$27 to $28; 10—$29 to $30; 11—$31 to $32; 12—$33 to $34; 13—$35 to $36.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$31 to $32; 11—$33 to $34; 12—$35 to $36; 13—$37 to $38; 15—$41.50 to $42.50; 16—$43 to $44.

Coke

Beehive Furnace Fuel Contracts Being Renewed at Lower Figures —Foundry Demand Steady

CONTRACTS for beehive furnace coke are being renewed as they expire at lower prices than applied earlier in the year, which is leading some pig iron producers to offer tonnage for third quarter at present prices. Shipments continue on a large scale. Production in the Connellsville district shows the first increase in more than a month.

Pittsburgh, April 30.—The beehive coke market is quiet and unchanged. Furnace coke consumers are getting sufficient fuel under regular contracts or from their own ovens to make additional buying unnecessary. In the spot market a fairly large supply of standard furnace coke is available at $2.75 to $2.85, but it is meeting with little demand. Shipments against old orders are well maintained and contracts expiring from time to time are being renewed, at lower prices than applied earlier in the year. Foundry coke demand is steady, with $3.75 the minimum price for standard fuel. Readjustment of production to meet the downward trend in demand appears halted for the present, output showing the first weekly gain in more than a month.

Production of coke in the Connellsville region for the week ended April 20 was 71,455 tons, compared with 69,095 tons the preceding week, according to the *Connellsville Courier*.

New York, April 30.—While spot demand for foundry coke is slow, specifications against first half contracts continue good. Prices generally are unchanged. By-product foundry coke is $11, delivered to most New England consuming points; $9 to $9.40, delivered at Newark, N. J., and $9 delivered at Philadelphia consuming points. Beehive foundry coke continues $3.75 to $4, Connellsville, and $4.85, Latrobe, Pa., ovens.

Buffalo, April 30.—Demand for foundry coke continues exceptionally heavy. District ovens are working at capacity. The price is $9, ovens.

Detroit, April 30.—Sustained operating rates among foundries making parts for the old model T Ford are accompanied by heavy by-product coke buying. Requirements continue to absorb output of local ovens and the price of $9, ovens, is firm. Domestic coke demand is shrinking.

St. Louis, April 30.—Demand for metallurgical coke continues active, by-product plants reporting current shipments well up to the average since Jan. 1. Consumer stocks are light. Prices are steady.

Birmingham, Ala., April 30.—A considerable tonnage of Alabama coke is being shipped into the Middle West. Consumption of foundry coke in Alabama is unchanged, and prices are steady.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.75 to 2.85
Connellsville foundry	3.75 to 4.85
New River foundry	6.00 to 6.50
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.75
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England del.	11.00
St. Louis del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell, basis	6.50
Portsmouth, O., ovens, Connell, basis	6.50
Buffalo, ovens	8.75
Detroit, ovens	9.00
Philadelphia, del.	9.00

Ferroalloys

Specifications Set New Record for Some Sellers

Pittsburgh, April 30.—Ferroalloy specifications during April held to the record rate that prevailed during March. Total tonnage for first four months was a new high for some sellers. A steady flow of specifications is looked for the remainder of the quarter. Practically all buyers are covered by contract. Small consumers are in the market occasionally for carloads. On such business $109.79, delivered Pittsburgh, for ferromanganese, and $34 for spiegeleisen are steady. Special ferroalloys are unchanged. Inquiry for fluorspar is slightly more active.

New York, April 30.—Active shipments against contracts and a good demand for spot carloads feature spiegeleisen. The price continues $34, furnace, for 19 to 21 per cent.

Wolframite is 16.00c and scheelite 16.50c to 17.00c. Tungsten is in demand, but almost no new supplies are appearing.

Bolts, Nuts, Rivets

Demand Holds Volume with Spot Buying Light and Prices Firm

NUT AND BOLT PRICES, PAGE 1206

Pittsburgh, April 30.—Rivet specifications are active and April shipments are expected to show a gain over March. Bolt and nut demand is at the rate of a month ago. Spot buying is light, contracts covering practically all tonnage. Prices continue 60 to 70 off for bolts and nuts, and 3.10c, Pittsburgh, for large rivets. Operations are 65 to 75 per cent.

Chicago, April 30.—April specifications for bolts and nuts were slightly under March, and about the same as a year ago. Farm implement orders are not as well sustained in bolts and nuts as in heavier finished steel products. The demand for large structural rivets is affected adversely by slow building operations. Bolts and nuts are 60 to 70 off.

Cleveland, April 30.—Demand for nuts, bolts and rivets appears well sustained. Rivet specifications, while not liberal, are sufficient to indicate firmness of the 3.10c price. Operations of nut and bolt plants average 70 to 75 per cent.

March Plate Orders Off; Quarter High

Washington, April 30.—Orders for fabricated plates in March declined slightly but the first quarter shows marked improvement over a year ago, as the following comparison by the department of commerce indicates:

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1928					
March	46,840	25,226	1,897	699	14,683
Total 3 mo...	132,447	61,859	7,638	2,067	46,515
April	50,347	22,095	4,654	619	16,265
May	42,487	14,852	4,744	202	17,768
June	35,202	12,204	3,225	778	15,803
July	35,959	16,881	1,848	499	12,159
Aug.	47,245	24,807	1,814	429	17,579
Sept.	40,281	18,572	1,642	386	13,976
Oct.	53,983	23,960	1,861	2,435	17,480
Nov.	54,277	32,381	2,081	563	10,731
Dec.	36,254	14,217	2,216	655	12,060
(Year)	528,482	241,828	31,723	8,633	181,336
1929					
Jan.	32,705	11,055	2,018	325	11,567
Feb.	*58,684	16,093	6,356	95	*18,468
March	57,262	21,719	5,656	631	15,138
Total 3 mo...	148,651	48,867	14,030	1,051	45,173

Ferroalloy Prices

(In dollars, except ferrochrome)

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh..	109.79
Spiegeleisen, 19 to 21 per cent, domestic furnace, spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.30 to 1.35
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producer's plant, net ton	160.00
Do., one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Quantity diff. apply on 100 tons and over.
*These prices contract, spot $5 higher.

Scrap

Heavy Tonnages Weaken Prices —Decline Is Slight as Melt Continues at High Rate

VARIOUS influences tend to weaken the scrap market in nearly all centers, but underlying conditions have prevented much decline. Prices have sagged somewhat under heavy offerings, but continued large consumption has counteracted this to some degree. Melters are taking material on contract but buying little.

Chicago, April 30.—Weakening influences tend to depress steelmaking grades of iron and steel scrap, while malleable, gray iron foundry, electric furnace grades and specialties retain strength. Country scrap is being drawn out more heavily by high prices and open weather. Rejections of this scrap have been heavy, and the appearance of the outside tonnage has had a bearish influence. On the other hand, several features of strength appear. Dealers have heavy unfilled orders and consumption shows sustained vigor. The slight dip in steelworks operations, due to repairs to furnaces and mill equipment, has had no appreciable effect on consumption of scrap nor on the market. Shipments to steelworks have been so steady that even the extraordinary power of consumers to absorb tonnage is becoming taxed. Heavy melting steel has been turned down irrespective of lower prices offered. The quotation of $15.75 to $16.25 for melting steel has become more general, representing a drop of 25 cents from recent levels. Cast borings are quoted nominally at $10.25 to $10.75 in the absence of demand.

Boston, April 30.—There has not

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	12.00 to 12.50
Boston, dealers	11.75 to 12.00
Boston, No. 2	10.00 to 10.50
Buffalo, No. 1	17.00 to 17.50
Buffalo, No. 2	14.50 to 15.00
Chicago	15.75 to 16.25
Cincinnati, deal.	13.25 to 13.75
Cleveland, No. 1	15.50 to 16.00
Cleveland, No. 2	15.00 to 15.50
Buffalo, No. 1	17.00 to 17.50
Detroit, No. 2	12.25 to 12.75
East Pa., del. mill	16.50 to 17.00
N. Y., deal., R. R.	13.00 to 13.35
N. Y., deal., yd.	8.25 to 9.50
Pittsburgh, No. 1	18.00 to 18.50
Pittsburgh, No. 2	16.00 to 16.50
St. Louis, No. 1	14.00 to 14.25
Valleys, No. 1	18.00 to 18.50

COMPRESSED SHEETS

Buffalo (dealers)	14.50 to 15.00
Chicago	13.75 to 14.25
Cleveland	15.00 to 15.50
Detroit	14.00 to 14.25
E. Pa. new mat.	15.00
Pittsburgh	18.00 to 18.50
Valleys	18.00 to 18.25

BUNDLED SHEETS

Buffalo	12.75 to 13.25
Cincinnati, deal.	11.00 to 11.50
Cleveland	13.00 to 13.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	16.00 to 16.50
St. Louis	10.00 to 10.50

SHEET CLIPPINGS LOOSE

Chicago	9.00 to 9.50
Cincinnati	9.50 to 10.00
Detroit	9.25 to 9.75
St. Louis	10.00 to 10.50

STEEL RAILS, SHORT

Birmingham	14.00 to 14.50
Boston	11.25 to 12.25
Buffalo	19.50 to 20.00
Chicago (3 feet)	19.00 to 19.50
Chicago, 2 ft. and under	20.00 to 20.50
Cincinnati, deal.	19.00 to 19.50
Detroit	17.00 to 17.50
Pittsburgh (3 ft.)	20.00 to 21.00
Pittsburgh, 2 ft. and under	20.50 to 21.50
St. Louis	16.50 to 17.00

STOVE PLATE

Birmingham	12.50 to 13.00
Boston consumers	11.50 to 12.00
Buffalo	13.50 to 13.75
Chicago, net	12.75 to 13.25
Cinn., deal., net	10.00 to 10.50
Detroit, net	9.00 to 9.50
Eastern Pa.	12.50 to 13.00
N. Y. deal., mill	8.75 to 9.00
Pittsburgh	12.50 to 13.00
St. Louis	13.25 to 13.75

COUPLERS, SPRINGS

Buffalo	19.50 to 20.00
Chicago	17.00 to 17.50
Eastern Pa.	20.00 to 21.00
Pittsburgh	21.00 to 21.50
St. Louis	15.00 to 15.50

ANGLE BARS—STEEL

Chicago	17.50 to 18.00
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	19.50 to 20.50
Eastern Pa.	21.00 to 22.00
Pitts. billet and bloom crops	23.00 to 24.00
Cleve. billet and bloom crops	17.50 to 18.00

FROGS, SWITCHES, GUARDS

Chicago	17.00 to 17.50
St. Louis	15.00 to 15.50

SHOVELING STEEL

Chicago	15.75 to 16.25
Cleveland	11.75 to 12.00
Detroit	10.75 to 11.00
Pittsburgh	18.00 to 18.50
St. Louis	14.00 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston, dealers	11.25 to 12.00
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	16.00 to 17.00
Chicago, No. 1	16.50 to 17.10
Chicago, No. 2	15.75 to 16.25
Cinn., No. 2	13.50 to 14.00
Eastern Pa.	16.00 to 16.50
N. Y., No. 1 deal.	12.00 to 12.50
Pittsburgh, No. 2	18.00 to 18.50
St. Louis, No.1	13.50 to 14.00
St. Louis, No. 2	13.50 to 14.00

SPECIFICATION PIPE

Boston	10.75 to 11.00
Eastern Pa.	15.50 to 16.00
New York, deal.	11.25 to 11.75

BUSHELING

Buffalo, No. 1	14.50 to 15.00
Chicago, No. 1	13.75 to 14.25
Cinn., No. 1 deal.	11.00 to 11.50
Cinn., No. 2	8.00
Cleveland, No. 1	13.00 to 13.50
Cleveland, No. 2	11.25 to 11.50
Detroit, No. 1	12.50 to 13.00
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston	6.75 to 7.00
Buffalo	7.75 to 8.25
Chicago	9.00 to 9.50
Cincinnati, deal.	9.00 to 9.25
Cleveland	9.50 to 10.00
Detroit	7.25 to 7.50
Eastern Pa.	11.50
New York, deal	8.00
Pittsburgh	11.75 to 12.75
St. Louis	8.00 to 8.50
Valleys	11.50 to 12.00

MIXED BORINGS, TURNINGS

For blast furnace use

Boston, dealers	6.00 to 6.25
Buffalo	11.50 to 12.00
Cincinnati, deal.	9.25 to 9.75
Cleveland	11.25 to 11.50
Detroit	9.00 to 9.25
Eastern Pa.	10.50
New York, deal.	6.50 to 7.00
Pittsburgh	11.75 to 12.75

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	7.00 to 8.00
Boston, chem.	10.00 to 10.50
Boston, dealers	6.50 to 6.75
Buffalo	11.50 to 12.00
Chicago	10.25 to 10.75
Cincinnati, deal.	9.25 to 9.75
Cleveland	11.25 to 11.50
Detroit	9.00 to 9.25
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	7.25 to 7.75
Pittsburgh	11.75 to 12.75
St. Louis	9.50 to 10.00

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago, net	13.00 to 13.50
Cincinnati	10.00 to 10.50
Eastern Pa.	12.50 to 13.00
New York, deal.	9.25 to 9.75
St. Louis	12.50 to 13.00

FORGE FLASHINGS

Boston, dealers	9.50 to 10.50
Buffalo	13.75 to 14.25
Chicago	10.50 to 11.00
Cleve. over 10 in.	14.00 to 14.50
Detroit	12.00 to 12.50
Pittsburgh (light)	15.00 to 15.50

FORGE SCRAP

Boston, dealers	9.00 to 9.50
Chicago	18.50 to 19.00
Eastern Pa.	14.00 to 14.50

ARCH BARS AND TRANSOMS

Chicago, net	21.50 to 22.00
St. Louis	22.00 to 22.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	14.50 to 15.00
Chicago	13.00 to 13.50
Cleveland	12.50 to 13.00
Eastern Pa.	15.00
Pittsburgh	16.00 to 17.00
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston, ship point	17.00 to 17.50
Buffalo	19.50 to 20.00
Chicago	19.05 to 19.60
Eastern Pa.	22.75 to 23.00
Pittsburgh	21.50 to 22.00
St. Louis	19.50 to 20.00

SHAFTING

Boston, ship point	14.00 to 14.25
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 20.00
New York, deal.	15.00 to 15.50
St. Louis	18.50 to 19.00

Irop Foundry Scrap

CAR WHEELS

Birmingham, iron	11.00 to 12.00
Boston, iron	14.00 to 14.50
Buffalo, iron	14.00 to 14.50
Buffalo, steel	19.50 to 20.00
Chicago, iron	14.50 to 15.00
Chi., rolled steel	19.00 to 19.50
Cincinnati	12.50 to 13.00
Eastern Pa. cast.	16.50
Eastern Pa., rolled	20.00 to 21.00
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	21.00 to 21.50
St. Louis, iron	15.00 to 15.50
St. Louis, steel	17.00 to 17.50

No. 1 CAST SCRAP

Birmingham, cup	13.00 to 14.00
Buffalo	16.25 to 16.75
Boston, textile	16.50 to 17.00
Chicago, mach.	17.90 to 18.50
Chicago, railroad	17.35 to 17.90
Chicago, agri.	16.25 to 16.80
Cincinnati, mach. cupolas, gross	19.50 to 20.00
Cleveland, cupola	16.50 to 17.00
Detroit, net	18.00 to 13.50
East. Pa., cupola	16.00 to 17.00
N. Y., cup., deal.	13.00 to 13.50
N. Y., del. local foundries	17.00 to 17.50
Pittsburgh, cupola	15.00 to 16.00
San. Fran., del.	13.50 to 14.00
Seattle	15.50 to 16.00
St. L. No. 1 mach.	15.25 t o15.75
St. Louis, No. 1	14.50 to 15.00
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	13.00 to 13.50
Cleve., breakable	12.50 to 12.75
Detroit, auto, net	15.00 to 16.00
Detroit, breakable	9.50 to 10.00
Eastern, Pa.	16.00
New York, deal	11.75 to 12.50
Pittsburgh	13.00 to 14.00

MALLEABLE

Boston, railroad	16.50 to 17.00
Buffalo	19.00 to 20.00
Chicago, agri.	16.00 to 16.50
Chicago, railroad	19.00 to 19.50
Cinn., R. R., deal.	15.50 to 16.00
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	16.00 to 16.50
Detroit, auto	15.00 to 15.25
St. Louis, rail	16.00 to 16.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	14.00 to 15.00
Boston, dealers	12.50 to 13.00
Rails scrap, Boston	11.00 to 12.25
Skeleton, Boston	9.50 to 10.00
Buffalo	16.50 to 17.50
Chicago	17.50 to 18.00
Eastern Pa.	18.00 to 18.50
New York	14.00 to 14.50
St. Louis	15.50 to 16.00

LOCOMOTIVE TIRES

Chicago, cut	19.00 to 19.50
St. Louis, No. 1	16.00 to 16.50

LOW PHOS. PUNCHINGS

Chicago	18.00 to 18.50
Pittsburgh	20.50 to 21.50

been much change in the scrap market in the past week. A boat is loading 3700 tons for Danzig, after which another steamer will take 1500 to 2000 tons. The present boat is loading on the old contract prices of $9.50 to $10.25 f.a.s., made up of 3/16-inch scrap. Otherwise buying is light and at lower prices.

New York, April 30.—A Leading Harrisburg, Pa., consumer of scrap has closed on several grades at 50 cents a ton under his previous prices, paying $11.50, delivered, on skeleton steel, $13 on stove plate, $13.50 on yard steel and $15.50 on heavy breakable cast. This reduction is expected to affect the dealers' buying market here shortly. Meanwhile, the market generally is unchanged, but easy. So far as can be learned no action has been taken by Claymont, Del., or Coatesville, Pa., consumers of railroad steel.

Pittsburgh, April 30.—Iron and steel scrap continues easy with most prices off further on recent sales. Heavy melting steel has declined 25 cents on substantial purchases at $18 and $18.50 for No. 1 and $2 less for No. 2. Compressed sheets are equally lower but supplies still are limited. Dealers covering contracts find most grades more plentiful, although consumption and shipments continue heavy. Steel specialties and blast furnace material are down 25 cents. Most low phosphorus grades are easier.

Buffalo, April 30.—Expected tonnage buying of No. 1 heavy melting steel is deferred. Dealers are making the market at $17.25 to $17.50. No new tonnage is being delivered on an open offer of $16.50, dealers say. Reports are that more than 25,000 tons of No. 2 heavy melting steel remains to be delivered on old contracts. Dealers offer $14.75 for suitable material.

Philadelphia, April 30.—Considerable heavy melting steel has been sold at prices establishing the market at $16 to $17, delivered. Dealers recently reduced prices and started shipping on contracts and relieved melters of their scrap problem, which was becoming acute.

Cleveland, April 30.—Local steel mill scrap users are inaugurating a strict program of shipment regulation. They will not permit dealers to exceed certain quotas weekly. All have good stocks and in some cases the cut is 62 2/3 to 75 per cent. This makes for slight price weakness. Although one small mill is offering $16.50 for high-grade heavy melting steel, the regular market is quotable at $15.50 to $16, with No. 2 at 50 cents less. High prices still are being paid in the valley, some offering $18.

Detroit, April 30.—Were it not for water shipment of scrap to blast furnaces at Cleveland, Erie, Pa., and Buffalo, this market would not retain its present strength. Open-hearth grades show some weakness because of rejections in Ohio territory and no new orders are being placed. Blast furnace scrap is up 25 cents to $9.25 to $9.50 and machine shop turnings advanced similarly to $7.25 to $7.50. Heavy melting stays at $14.25 to $14.50. Cast iron borings are scarce because several automobile companies are supplying their need for auto cast by briquetting their own borings. May lists of scrap from automobile plants are 25 to 33 1/3 per cent heavier than in April.

Cincinnati, April 30.—The market for iron and steel scrap continues quiet. Shipments on contracts are going forward at fair rate. Heavy melting steel slipped 25 cents to $13.25. Minimum price and loose sheet clippings also took a 25-cent tumble. Other prices remain firm.

St. Louis, April 30.—Demand for iron and steel scrap holds up fairly well, but chiefly in sympathy with weakness at Chicago and points further east, prices here have yielded after a number of weeks of marked strength. Another factor has been a heavy influx of railroad scrap and a moderate revival in shipments from the country.

Birmingham, Ala., April 30.—Market continues unsettled with considerable old material moving on contracts. Consumers are ordering delivery against contracts more liberally but are not buying.

Toronto, Ont., April 30.—Neither Toronto nor Montreal dealers have made any change in iron and steel scrap buying prices. The recent advances, however, tended to bring out larger supplies of some grades, but the supply is barely keeping ahead of demand.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	15.00
Iron axles	17.00
Heavy melting steel	9.50
Turnings	7.50
No. 1 mach. cast (net)	16.00
Malleable (net)	14.00

Semifinished Steel

Tonnage to Be Scarce for Some Weeks —Prices Nominal

SEMIFINISHED STEEL PRICES, PAGE 1206

Pittsburgh, April 30.—Little change is looked for in the tight situation in semifinished steel for several weeks. Backlogs of bars and sheets still are sufficient to insure heavy operations well through May and steel producers are requiring all of their ingot output for their own finishing mills and regular customers. On three occasions recently consumers have purchased ingots in lieu of billets and sheet bars. Some producers are able to balance raw steel output with their own requirements while finishing operations of others have been handicapped due to steel scarcity. Some inquiry has been received for sheet bars and billets recently but no producer is able to take any large tonnage and practically all are out of the market entirely. The price situation still is nominal in view of the lack of business but it is evident that sales could not be effected below the recently announced price of $36 for 4 x 4-inch rerolling billets, slabs and sheet bars. Wire rods are firm and in steady demand at $42.

Philadelphia, April 30.—Billet makers have advanced prices $2 and now are asking $36, base, Pittsburgh, for rerollers and $41 for forging quality. No business has been done at the higher prices because consumers covered to the end of this quarter at the former prices.

Youngstown, O., April 30.—So heavy is sustained demand for billets, sheet bars and wire rods that producers continue to call upon outside mills for supplementary tonnages for their finishing mills. From present indications there is slight chance of new consumers of any grades of semifinished material getting their orders on the books of local mills for some months. Billets and slabs are $35, and sheet bars $36, Pittsburgh and Youngstown, while wire rods are $12. Pittsburgh and Cleveland.

Cleveland, April 30.—Demand for sheet bars, billets and slabs continues heavy, and customers' requirements are beyond the ability of the leading local producer to supply, though it is operating at the highest point in its history. These contracts are on a basis of $35, Cleveland or Youngstown for sheet bars, and $34 for billets and slabs, for second quarter. The local producer is shipping all that it makes on these contracts, and no material is available in the open market in this district.

Chicago, April 30.—Little activity is being shown in semifinished steel as producers are unable to offer any material in the open market. Sheet bars have been advanced $2 a ton and now are quoted on the basis of $37, Chicago. Consumers of special forging billets and slabs in this territory have been forced to buy steadily from eastern mills.

Alloy Steel

Specifications Decline but Shipments Fall Short of Active Needs

Detroit, April 30.—Specifications this month for alloy bars to be used in May-June have receded as much as 20 to 30 per cent compared with March. For immediate use tonnage is heavy and producers could take on more if they could make the desired delivery. Shipments against some 2.55c, mill base, contracts still are being made but the quotable market is at a 2.65c minimum for alloy quality.

The Market Section

Bars

Deliveries Continue Deferred but Demand Slackens Somewhat—Mills Make Little Progress

COMPARISONS of April bar tonnages with March show a decline, since the latter included specifications on expiring contracts. In spite of this comparison mills have made little progress in reducing backlogs and deliveries still are extended. Steady buying by most users prevents much reduction of backlogs. Prices are steady and firm at established levels.

BAR PRICES, PAGE 1205

Chicago, April 30.—No relief is seen in bar deliveries, which are extended 13 to 16 weeks, virtually the same as plate deliveries. Buyers feel that the tension of bar deliveries soon may be eased somewhat, as backlogs in bars apparently are more subject to defections. Acute shortage of some grades of finished steel, such as special forging steels, has helped to stimulate the heaviest ordering of finished steel material outside the Chicago district in years. Plate tonnage being purchased in the East is of less consequence, although Chicago mills are crowded to capacity, and no relief is in sight immediately. Probably not since 1910 have Chicago consumers turned to eastern mills for so much tonnage, particularly for special sections for forging, billets and semi-finished steel. Outside plate tonnage comes largely from two eastern mills. Forward buying is less spirited but specifications apparently are unchanged and slightly exceeds shipments. April daily rate of shipments are slightly under March, but it is indicated April output will be a record for that month. Some bar and other finished steel tonnage has been sold into August to producers desirous of protection. Recent mergers of farm implement companies have not affected heavy implement demand.

Soft steel bars are quoted on the basis of 2.05c to 2.15c, Chicago, although many large buyers are under the tonnage differential classification. Alloy steel bar mills are operating at capacity, with prices unchanged. Rail steel bar mills are enjoying a good industrial and fence post business. Rail steel bars are 1.95c, Chicago Heights, to the manufacturing trade.

New York, April 30.—While steel bar specifications in April have been less than March, vitality of demand in April has been satisfactory, especially in view of the extent to which specifications in March intimated forward requirements. New business in steel bars continues good and a feature is demand from warehouses. The forging industry also continues to take large tonnages of bars. Prices continue firm at 1.95c to 2.05c, base, Pittsburgh, equivalent to 2.29c to 2.39c, delivered, New York. The asking price on iron bars continues 1.90c, base, Pittsburgh, and this is obtained on most sales. Where attractive lots are involved, however, the market is 1.80c to 1.90c.

Pittsburgh, April 30.—New business in hot-rolled merchant bars during April declined below the heavy March tonnage although leading producers estimate last month's business at fully 75 per cent of the total for March. This was considerably above early April expectations, when new buying declined sharply as the result of heavy tonnage placed in closing first quarter contracts. Consistent buying is coming from a diversified list of users. Deliveries of most producers still are extended three to four weeks with even later dates asked on several small sizes. Backlogs gradually are being worked off, however, and unless new buying increases appreciably shorter delivery dates will be effected within the next three or four weeks. The market is firm at 1.95c, Pittsburgh.

Detroit, April 30.—Larger merchant bar sellers here note no letdown in specifications for May and some are receiving them into June. April shipments largely have been on a par with March. Some water shipments are coming in. No change is noted in the price, 1.95c, Cleveland or Pittsburgh mill.

Philadelphia, April 30.—Bar specifications are fair, considering the extent to which consumers anticipated their requirements in March. Mills as a rule are unable to promise shipments in less than three to four weeks, while hoops and bands cannot be had under eight weeks. Considerable new business is present in the bar market. Price levels continue firm at the stabilized level, 1.95c to 2.05c, base, Pittsburgh.

Plates

New Business Declines, and Earlier Shipments Are Assured —Chicago Mills Overloaded

THE volume of new plate orders is diminishing, and the delivery situation is easier save at Chicago. The leading interest and a Milwaukee fabricator share in an order for 80,000 tons for a 400-mile 22-inch pipe from Monroe, La., to St. Louis. A Milwaukee district maker of welded pipe has placed over 800,000 tons of plates on mill books since last December.

PLATE PRICES, PAGE 1205

Chicago, April 30.—Plate deliveries are extended as much as 16 weeks in some sizes. Miscellaneous buyers continue to take tonnages from outside producers for the sake of quicker deliveries. A Cleveland mill and a Buffalo mill are supplying most of the plate tonnage purchased outside. National Tube Co. and A. O. Smith Corp. have been awarded 30,000 and 50,000 tons, respectively, of 400 miles of 22-inch pipe from Monroe, La., to St. Louis industrial district for Standard Oil Co. About 1100 tons of oil tankage plates was purchased by a Chicago district fabricator for southwestern refinery work. Forward buying has declined sharply, but backlogs are so extensive that operations at present capacity are assured well into August. Since last December western car orders brought over 900,000 tons of bars, plates and light shapes to mill books, and a Milwaukee district maker of welded pipe has placed over 800,000 tons of plates on mill books. Shipments against the latter order are proceeding at about 1500 tons daily and nearly twice that amount could be used if available. Eastern mills have been equalizing Chicago district base price on orders booked in this territory. Mills see a stronger price situation for beginning of third quarter. The base price is 2.05c to 2.15c, Chicago.

Boston, April 30.—A contract for 1500 tons of plates has been awarded by Boston to Biggs Boiler Works Co., Akron, O. The plate market here is steady.

New York, April 30.—New business being booked by plate mills is not sufficient to replace current shipments. Backlogs show a tendency to shrink and this has moved deliveries appreciably closer. Eastern mills continue to operate at about 80 per cent. One mill has booked some business for shipment within four days. Practically any of the eastern mills can ship universal plates in 10 days or less. Eastern mills have developed a large business during the past two years in heavy plates for use as column bases in building construction, the steel plates have supplanted cast iron bases almost entirely. As a rule these column bases require plates between 2 and 7 inches thick, and plates as thick as 9 inches have been purchased for column bases. The plate market here continues firm at 2.05c to 2.15c, base, Coatesville, equivalent

to 2.22½c to 2.32½c, delivered New York. Two boats for the Porto Rican service of Atlantic, Gulf & West Indies Steamship Co. will require about 12,000 tons of steel each. Demand for floor plates with raised patterns has shown a steady increase. The price of such plate continues firm at 3.65c, base, Pittsburgh.

Philadelphia, April 30.—Plate demand is more active. Eastern mills are able to promise sheared plates in one to four weeks, and universals in one to two weeks. Plates continue firm at 2.05c to 2.15c, base, Coatesville, or 1.95c to 2.05c, base, Pittsburgh, according to which basis figures out to the lowest delivered price at consuming point. The Norfolk & Western is expected to close soon for 5000 tons of steel for 500 automobile box cars.

Pittsburgh, April 30.—Plate tonnage showed material expansion in April and producers were able to effect slight increases in backlogs. Heavier commitments by freight car builders accounted for a large share of recent business, although barge work and miscellaneous uses contributed substantial tonnages. Deliveries generally do not present great difficulty. The steady demand is permitting producers to take a firm stand on prices, and 1.95c, Pittsburgh, is holding on new orders.

Detroit, April 30.—While most plate mills are quoting six to eight weeks delivery, one maker is naming three weeks on sheared and 10 days on universal. Demand holds up well. A car ferry for the Wabash railroad will take 1500 tons. A water pipe for Detroit at Eight Mile road, 9300 feet of 54-inch plates, ½-inch thick, will take a large tonnage. The 5000-ton water intake for the Ford Motor Co. plant is in abeyance.

CONTRACTS PLACED

1500 tons, Boston, to Biggs Boiler Works Co., Akron, O.

1100 tons, oil storage tank work for southwestern refinery interests, to unstated Chicago fabricator.

175 tons, boiler for Snoqualmie Falls Timber Co., Snoqualmie Falls, Wash., to Puget Sound Machinery depot.

CONTRACTS PENDING

1600 tons, 9300 feet of 54-inch welded ½-inch plates for water pipe at Eight Mile road, Detroit. Bids in.

1500 tons, car ferry for Wabash railroad, Detroit, Bids in.

Unestimated tonnage, for six 80,000 barrel steel storage tanks for Vacuum Oil Co., at Allegany, N. Y. Chicago Bridge & Iron Works, contractor.

Buys Plant at Madison

Chicago, April 30.—Hyman-Michaels Co., Chicago, iron and steel scrap dealer and rail broker, has purchased the plant of the Standard Rail & Steel Co., Madison, Ill., to provide more facilities for preparation of scrap in the St. Louis district.

Pipe

Slow Buying Due To Be Supplanted Soon By Activity—Much Tonnage Is Pending

LIGHT awards at present are due to be followed soon by larger tonnages, since 30,000 tons at Albany, N. Y., 3340 tons at Detroit, 1300 tons in Franklin county, O., 1000 tons at Milwaukee and scattered smaller lots are slated for early placing. About three-fourths of the large line from Monroe, La., to St. Louis went to A. O. Smith Corp., the remainder went to National Tube.

PIPE PRICES, PAGE 1206

New York, April 30.—Fresh demand for cast pipe continues exceedingly slack, and while prices are unchanged, the market is soft. United States Pipe & Foundry Co. is again low bidder on the entire 30,000 tons of 48-inch cast pipe for Albany, N. Y., with Warren Foundry & Pipe Co. reported low on one small section.

Pittsburgh, April 30.—A gradual increase in demand for merchant pipe is the accompaniment of more active building operations. This is offsetting the slower pace in commitments for tubular material from the oil country. At the same time, mechanical tubing and boiler tubing hold to the active pace which prevailed during the first quarter. Pipe mill operations were stepped up slightly during recent weeks and now are holding at 55 to 60 per cent for welded pipe with seamless operations varying from 75 to 90 per cent.

Cleveland, April 30.—For the past week or 10 days, buttweld pipe demand from plumbers' supply jobbers has fallen off. Mill supply jobbers buy small lots of lapweld occasionally but the buying rate lacks vigor, the turnover not being up to expectations. Mill deliveries still are about a week deferred, indicating good order books.

Boston, April 30.—While private pipe business was fair, municipal lettings were scarce. Providence, R. I., opened bids on 600 tons of 12-inch pipe. The 300 tons of 6 to 12-inch for Cambridge, Mass., has not yet been awarded. Chelsea, Mass., opened bids April 26 for 300 tons of 6 to 12-inch pipe. Prices are firm, but concessions of about $1 a ton prevail on larger than 12-inch.

Chicago, April 30.—Additional cast iron pipe tonnage is shaping up in the Chicago district and the Detroit metropolitan area is expected to furnish further orders. The 1300 tons of 4 to 24-inch pipe for Franklin county, Ohio, still is pending. Milwaukee took bids today on 1000 tons of 30-inch and larger cast pipe. Detroit has 3340 tons of 6 and 16-inch pipe pending. Fresh municipal business is disappointing. Chicago delivered prices for carload orders are reported steady at $45.20 to $46.20, or $37 to $38, base Birmingham.

Birmingham, Ala., April 30.—Only a few cast pipe lettings have been reported lately but production has not been visibly curtailed. Operations still are estimated at 80 per cent. Demand favors centrifugal or monocast pipe and shipments are steady with practically all sections of country ready to begin developments in which cast iron pressure pipe will be used. No change in quotations is noted, 6-inch and over sizes still commanding $37 to $38, according to lots.

CONTRACTS PLACED

STEEL PIPE

400 miles of 22-inch steel and electrically welded pipe, about 80,000 tons, for the Standard Oil Co., from Monroe, La., to St. Louis industrial district, 73 per cent to A. O. Smith Corp., and the remainder to National Tube Co.

CAST PIPE

300 tons, 6 to 12-inch class 150, Edmonton, Alta., to American Cast Iron Pipe Co.

CONTRACTS PENDING

STEEL PIPE

1300 tons, 30 to 48-inch welded or lock-bar pipe line, East Bay municipal utility district, Oakland, Calif. Bids May 1.

Unstated tonnage, Rahway Valley sewage disposal line, Westfield, N. J.; general contractors' bids to be opened May 2. It is probable a large portion will be concrete pipe.

CAST PIPE

30,000 tons, 48-inch cast pipe, Albany, N. Y., United States Pipe & Foundry Co., low bidder on entire tonnage; Warren Foundry & Pipe Co. low on one small section.

1000 tons, 30-inch and larger cast iron pipe for Milwaukee; bids April 30.

600 tons, 12-inch pipe for Providence, R. I. Bids opened April 29.

300 tons, 6 to 12-inch pipe for Chelsea, Mass. Bids opened April 26.

300 tons, 6 to 12-inch pipe for Cambridge, Mass. Bids opened April 10.

264 tons, 4 and 6-inch class B, Vallejo, Calif. Bids May 1.

254 tons, 4 to 8-inch class 150, Arroyo Grande, Calif. Bids May 1.

136 tons, 6 and 8-inch class 250, Alhambra, Calif. United States Pipe & Foundry Co. is low bidder.

118 tons, 6, 8 and 12-inch, for Buffalo. Bids May 9.

Chicago Near Capacity

Chicago, April 30.—The steelworks operating rate in the Chicago district again is close to 98 per cent, or near capacity. Nominally, operations are 95 to 98 per cent of rated capacity, this variation being due to repairs being made to open-hearth furnaces.

Twenty-nine of the 36 steelworks furnaces in the district are active. It is expected the rate of operations will show some variation within the next few weeks, due to the much needed repairs that are being made. In general, April operations were slightly under March, due to shortages of semifinished steel and to repairs.

Tin Plate

Shipments Heavy—Second Quarter Price Expected Soon

TIN PLATE PRICES, PAGE 1206

Pittsburgh, April 30.—Tin plate mill operations are maintained at around 97 per cent, with specifications on hand against first quarter contracts sufficient to insure a high rate of operations well through remainder of second quarter. Most large consummers have specified fully against first half contracts. Books have not been opened for third quarter, but since specifications are due May 15 for July shipment it is expected that new contracts will be signed shortly. In the past the price of tin plate rarely has been changed in the middle of the year, due partly to the fact cans are sold on a price basis to apply throughout the season. The present market is $5.35 per 100-pound base box, Pittsburgh.

Iron Ore

Heavy Shipments Feature Trade—New Sales Moderate

IRON ORE PRICES, PAGE 1206

Cleveland, April 30.—Vessel shipments of Lake Superior iron ore in April total between 1,500,000 and 2,000,000 tons, the complete reports not yet being compiled. This compares with one cargo of 5946 tons in April last year, indicating the energy displayed by shippers in getting new tonnage to the furnaces. Furnace interests generally have taken care of their requirements for the season, and new sales are limited to filling-in orders. One maker booked 50,000 tons in the week.

Pittsburgh Rate Is 95

Pittsburgh, April 30.—Steelmaking operations are well sustained at around 95 per cent of ingot capacity. Finishing operations are steady, except for a slight dip in sheet production to 95 per cent, due to difficulty in obtaining sufficient sheet bar requirements. Tin plate operations hold around 97 per cent, strip mills are running full, pipe mill operations are 55 to 60 per cent for welded pipe, and 75 to 90 per cent for seamless material.

Building and engineering contracts placed in New England in February totaled nearly $26,000,000 and was the highest February total in history.

Sheets

Market Active and Firm—Backlogs Little Reduced—Furniture Sheets Sold on New Basis

SHEET demand continues strong, and prices firm. Leading mills are eliminating lower grades of steel furniture sheets, and selling one grade known as metal furniture stock, on a No. 24 gage base price of 4.20c, Pittsburgh. Black sheet gage differentials are being applied for heavier gages wanted by furniture makers. Eastern users are buying various grades for third quarter.

SHEET PRICES, PAGE 1205

Pittsburgh, April 30.—Sheet backlogs suffered but little as a result of heavy shipments in April. New business and specifications during that month were heavy and hold deliveries on all grades in their former extended positions. Operations are slightly below capacity due to insufficiency of semifinished material. New business is well sustained. Deliveries on autobody sheets still are extended five to six weeks. The price situation continues to grow firmer and in several instances recently buyers have placed business that originally was withheld on account of price. On current tonnage producers are able to obtain 2.95c, Pittsburgh, for sheet mill black, 3.70c for galvanized, and 2.20c for blue annealed. Tin mill black continues 3.00c, and autobody 4.10c. Producers of metal furniture sheets are revising extras for pickling and are eliminating the grade B material. Operations are around 95 per cent.

New York, April 30.—A substantial amount of new sheet business is being placed. Mills are adhering to 2.95c, base, Pittsburgh, for black, 3.70c for galvanized and 2.20c for blue annealed. Galvanized sheets in some instances are sold at 3.60c, and black at 2.85c. Asking prices on blue annealed sheets sometimes are 2.25c and 2.30c. A good size business is noted in wide strip at 2.10c, base, Pittsburgh. A fair amount of third quarter sheet tonnage has been booked, prices to be named later.

Buffalo, April 30.—Some producers of full finished sheets are now booking orders for shipment after July 1. The price is 4.365c, Buffalo. Black sheets are 3.215c, Buffalo.

Cleveland, April 30.—Despite a letdown in specifications in a few directions for sheets to be used in June and July, shipments are heavy. One company estimates it has lost at least 40,000 tons of prompt business in high-grade sheet metal during the past two months because it was so heavily obligated on autobody and metal furniture stock. Prices are steady.

Detroit, April 30.—April sheet shipments were fully up to the high record established in March. May promises to sustain that rate. Specifications for material to be used in June are falling off slightly in some directions, and 10 to 30 per cent in others. Some customers would take more tonnage if they could get it delivered immediately. Despite this condition price deflections of $2 per ton occasionally occur, down to 2.75c, Pittsburgh, on black sheets and 2.10c on blue annealed. While the quoted market on galvanized is 3.70c, a 3.65c price appeared recently on a tonnage which a certain mill wanted. The full finished price 4.10c is firm.

Philadelphia, April 30.—Sheet mills are booked several weeks to two months. A fair volume of new business is being booked at 3.60c to 3.70c, base, Pittsburgh, for galvanized and 2.85c to 2.90c for black. Blue annealed generally are 2.20c, with the automotive trade getting 2.10c. Blue annealed prices are tending to advance and some sales are bringing 2.25c and 2.30c.

Chicago, April 30.—Forward buying of steel sheets is fair and specifications against second quarter contracts are moderately heavy. Deliveries have been extended seven to eight weeks in blue annealed sheets, and the lighter gages of black and galvanized are not far behind. One producer continues to maintain five-day weekly operations because of shortage of sheet bars. Chicago delivered quotations are reported unchanged at 3.10c for No. 24 black, 3.85c for No. 24 galvanized, and 2.35c for No. 10 blue annealed.

St. Louis, April 30.—Producers and distributors of sheets report business is good, in new orders, specifications and shipments. Blue annealed sheets are especially brisk, the leading producer reporting deliveries deferred six to seven weeks. Prices are unchanged.

Youngstown, O., April 30.—Elimination of the lower grade of steel furniture sheets by leading mills is being hailed here by sheetmakers with considerable satisfaction. Sheetmakers up to this time manufactured two grades of sheets for furniture, A and B. Hereafter there will be but one grade of sheets sold to furniture builders and it will be known as "metal furniture" stock, sold on a No. 24 gage base at 4.20c, Pittsburgh. The usual black sheet gage differentials will apply for the heavier gages. The new price will not include resquaring and oiling, which is about 5 per cent of the price. Formerly the full pickled extra was 75 cents, this for full-pickled cold-rolled and resquared over the black sheet base for

(*Concluded on Page* 1221)

Structural Shapes

Active Building Programs Slated for May—April Tonnage Exceeds Last April's—Subways Take 16,000 Tons—Prices Are Firm

BUILDING operations, active in March and April, bid fair to continue so throughout May. A vast amount of work is projected the country over and if but 75 per cent of it materializes, fabricators will have an active summer. Recent subway lettings in New York involve 16,000 tons, and electrification work awarded by the Pennsylvania will take 6600 tons. Similar work about to be let by the Reading Co., involves 4000 tons. Two jobs let in Los Angeles take 2000 tons apiece and several other awards take 1000 tons or more at a time. Two building jobs let in Cleveland aggregate 11,500 tons. Mills report sustained specifying rates in many directions, serving to force them further to post-date deliveries. The 1.95c, Pittsburgh, price is firm.

STRUCTURAL SHAPE PRICES, PAGE 1205

New York, April 30.—Eastern shape mills continue to operate at a high rate with deliveries further extended. Considerable tonnage has been placed with eastern mills because of congestion at the mills in the Chicago district. Local demand continues brisk, with inquiry more notable at the moment than actual buying. Prices are unchanged.

Boston, April 30.—The week was somewhat better for structural interests. A 1200-ton hotel was awarded the New England Structural Steel Co. Phoenix Bridge Co. was awarded 350 tons for two bridges by the Boston & Maine railroad. Harvard university's gymnasium will take 980 tons, instead of 100 tons. Plans for a $10,000,000 highway bridge connecting City Point, South Boston, with Hull, five miles distant, have been prepared by a committee on highways. The price situation is firm.

Philadelphia, April 30.—Structural demand has improved in the past week but the price situation is the same as described a week ago, with lower quotations in evidence in some directions. The market, delivered Philadelphia, now is around 2.00c to 2.11c.

Pittsburgh, April 30.—Structural steel fabricators are more optimistic regarding future business since they are quoting on an increased number of projects. Specifications for plain material are well maintained, improvement being shown over the rate last month. This district still lags slightly in new work from the standpoint of large tonnages, although a fair total of small-lot jobs is appearing. Producers hold to the 1.95c, Pittsburgh price on new business.

Buffalo, April 30.—Prospects for a good demand for structural shapes in May and June are bright. A 1200-ton school will be placed this week. Bids will be taken on the new municipal building the latter part of this month. Architects estimate that 6000 to 7000 tons of structural will be needed. Several other jobs are coming along and will reach contract stage shortly. Shape mills are on double turn and likely to continue on heavy production through the quarter.

Cleveland, April 30.—The second unit of the plant for the Chase Brass & Copper Co., Euclid, O., taking 3000 tons, has been let to Austin Co. Fabrication of the first unit was done by McClintic-Marshall Co. at Buffalo, from which point this additional steel will probably be delivered by boat. An 8500-ton job was let. Prospects are bright for the summer, should all projected work materialize. Mill specifications are sufficient to tie up deliveries five to six weeks or more. The 1.95c, Pittsburgh price, is firm.

Detroit, April 30.—While many large building projects are contemplated for the next three years, several in the 100 to 2000-ton range have taken definite form and are out for bids. Among recent awards 1700 tons for the Henry Ford museum at Dearborn, Mich., is the largest. It went to the Whitehead & Kales Co. Mills report that specifications are unabated and that the 1.95c, Pittsburgh, price is firm. Bids on material fabricated and erected still are in builders' or owners' favor.

Chicago, April 30.—Structural deliveries continue to be extended as much as eight weeks, due largely to the demands of car builders. Engineers and architects see good building prospects later this spring and during the summer months. Awards now are mostly smaller projects. Much public work is being held up in Chicago because of depleted city finances. Inland Steel Co. has a building program in prospect at its Indiana Harbor works which will take about 4000 tons. The 2.05c to 2.15c, Chicago, base price for plain material prevails, but differentials apply for tonnage orders.

CONTRACTS PLACED

16,000 tons, subway sections 3 and 4, route 108, Queens, New York, to American Bridge Co.

8500 tons, power house, Ashtabula, O., Cleveland Electric Illuminating Co., Cleveland, to American Bridge Co.

7000 tons, electrification towers, Pennsylvania railroad, Philadelphia to Trenton, N. J.; 6000 tons to Bethlehem Steel Corp., 1000 tons to unidentified fabricator.

5000 tons, miscellaneous bridge work, Chicago & North Western railroad, to unstated fabricator.

4500 tons, court house and city hall, Camden, N. J., to American Bridge Co.

3200 tons, Shroder & Koppel building, Fifty-eighth street, New York, to McClintic-Marshall Co.

3000 tons, second unit, Chase Brass & Copper Co., Euclid, O., to Austin Co. Fabrication probably done by McClintic-Marshall Co., which fabricated 3000 tons for the first unit at Buffalo.

2000 tons, May department store, Los Angeles, to Consolidated Steel Corp.

2000 tons, building, Federal Reserve bank, Los Angeles, to Consolidated Steel Corp.

1700 tons, Henry Ford museum, Deaborn, Mich., to Whitehead & Kales Co.

1600 tons, building, American Cyanide Co., Warners, N. J., to Montgomery Iron & Steel Co.

1400 tons, Jaffa temple, Johnstown, Pa., to Brown-Fayro Co.

1400 tons, Lake avenue bridge, Duluth, to Missouri Valley Bridge & Iron Co.

1300 tons, state highway bridge, Knoxville, Tenn. to Virginia Bridge & Iron Co.

1200 tons, hotel, Boston & Maine railroad, Boston, to New England Structural Steel Co.

1100 tons, building, Title Guarantee & Trust Co., East Forty-fifth street, New York, to Bethlehem Fabricators Inc.

850 tons, building for Connecticut River Power Development Co., Inwood, Vt., to Shoemaker Bridge Co.

700 tons, public school No. 102, Brooklyn, N. Y., to Harris Structural Steel Co.

600 tons, two factories, Olds Motor Works, Lansing, Mich., to Mahon Structural Steel Co.

550 tons, bridges, Pennsylvania railroad in Indiana to American Bridge Co.

500 tons, building, Detroit Waxed Paper Co., Detroit, to Massillon Bridge & Iron Co.

500 tons, building, Consolidated Copper Co., McGill, Nev., to Kansas City Structural Steel Co.

400 tons, Pennsylvania railroad bridge, Pittsburgh, to Fort Pitt Bridge Works.

400 tons, plant addition for Ingersoll-Rand Co., Painted Post, N. Y., to American Bridge Co.

390 tons, plant, General Motors Corp., Pontiac, Mich., to Mahon Structural Steel Co.

375 tons, cannery at Honolulu for Hawaiian Pineapple Co., to California Steel Co.

375 tons, weaving shed, Collins-Arkman Corp., Roxboro, N. C., to Carolina Steel & Iron Co.

350 tons, two bridges for Boston & Maine railroad, Greenfield, Mass., to Phoenix Bridge Co.

350 tons, girders and trusses in connection with textile high school contracts, New York, awarded through Easton Structural Steel Co. to Bethlehem Steel Corp.

350 tons, plant, Sparks-Withington Co., Jackson, Mich., to Whitehead & Kales Co.

315 tons, Goldblatt department store, Chicago, to Wendnagel & Co.

Awards Compared

	Tons
Awards this week	71,782
Awards last week	32,435
Awards two weeks ago	52,366
Awards this week in 1928	32,757
Average weekly awards, April	51,962
Average weekly awards, 1928	39,082
Average weekly awards, 1929	43,225
Total awards to date, 1928	698,443
Total awards to date, 1929	778,048

250 tons, cylinder piers for F. W. Schwiers Co., Atlantic City, N. J., to American Bridge Co.
235 tons, bank building, Citizens Savings Bank Co., through Poppen Realty Co., Muskegon, Mich., to Russel Steel Construction Co.
200 tons, airplane hangar, Long Island City, N. Y., to Virginia Bridge & Iron Co.
200 tons, branch building, International Harvester Co., Milwaukee, to Milwaukee Structural Steel Co.
200 tons, bakery, Home Dairy Co., Flint, Mich., to Flint Structural Steel Co.
200 tons, final plant unit, Graselli Chemical Co., Detroit, to Whitehead & Kales Co.
200 tons, store building, Sears, Roebuck & Co., through Good Speed Realty Co., Grand Rapids, Mich., to Flint Structural Steel Co.
200 tons, school building St. Theresa church, Detroit, to Detroit Metal & Steel Co.
185 tons, apartment, Pacific and Luguna streets, San Francisco, to Golden Gate Iron Works.
180 tons, state highway bridge, Elizabeth, N. J., to American Bridge Co.
175 tons, cannery, Fifty-fourth avenue, Oakland, Calif., to California Steel Co.
170 tons, store, Kresge Co., Grand Rapids, Mich., to Russell Steel Construction Co.
160 tons, addition, Heintz Mfg. Co., Philadelphia, to Lehigh Structural Steel Co.
150 tons, freight office building, Wabash railroad, Twelfth street, Detroit, to Whitehead & Kales Co.
146 tons, building, Lyon Metal Products Co., Aurora, Ill., to Milwaukee Structural Steel Co.
135 tons, underpass at San Pedro, Calif., to McClintic-Marshall Co.
125 tons, Northern Ohio Food Terminal Co., Cleveland, unit No. 4, to Republic Structural Iron Works, through Sam W. Emerson Co., general contractor.
125 tons, high school, Inglewood, Calif., to Minneapolis Steel & Machinery Co.
115 tons, tramway, Paramount Famous Lasky Corp., Los Angeles, to Consolidated Steel Corp.
108 tons, warehouse, Anderson-Hunter Co., Danville, Va., to Carolina Steel & Iron Co.
102 tons, addition to Robert E. Lee hotel, Greensboro, N. C., to Carolina Steel & Iron Co., through Angle-Blackford Co.
100 tons, two bridges, Erie railroad, Harrison, N. Y., to Phoenix Bridge Co.
100 tons, garage, East Seventy-seventh street, New York, to A. E. Norton Inc.
100 tons, plant addition, Fifth and Heinz streets, Berkeley, Calif., to Judson-Pacific Co.

CONTRACTS PENDING

8150 tons, subway section 6, route 107, New York, John J. Kennedy low on general contract.
4300 tons, electrification towers, Reading railroad, between Jenkinstown and Lansdale, Pa.
500 tons, substations, Pennsylvania railroad.
2000 tons, building, National Union Bank, Jackson, Mich. Bids closed April 12.
2000 tons, Eleventh street viaduct, Tacoma, Wash. Bids in May.
1500 tons, building, Union Bank & Trust Co., Flint, Mich.
1400 tons, copper smelting building at Ajo, Ariz.
1300 tons, vocational school, Grand Rapids, Mich. Bids in.
1200 tons, steel columns, warehouse, Peoples Outfitting Co., Detroit. Bids in.
1200 tons, Burgard school, Buffalo, Mosier & Sommers, Buffalo, general contractors.
1000 tons or more, Elks' temple, East Jefferson avenue, Detroit. Architect making plans.
1000 tons, factory, Checker Cab Co., Kalamazoo, Mich.
980 tons, Harvard university gymnasium, Cambridge, Mass., previously reported 100 tons.
800 tons, building, Fox Film Corp., West Fifty-sixth street, New York.
700 tons, warehouse, Detroit Insulated Wire Co., Detroit. Bids in.
600 tons, viaduct, Union Pacific railroad at Laramie, Wyo.
600 to 700 tons, locomotive sheds, Cleveland Union Terminal Co., Cleveland, previously reported as involving 200 tons. Bids in April 30.
600 tons, hotel, East Twenty-first street, New York, Post & McCord, erectors.
560 tons, Baptist Home for the Aged, 200 Thirty-fifth street, New York.
500 tons, bridge between Port Huron, Mich., and Sarnia, Ont. General contract to A Bentley & Son, Toledo, O.
500 tons, garage, Detroit Street Railways, Detroit. Bids taken.
400 tons, building, Waiker Bros., Spring Mill, Pa.
400 tons, bridges, Pennsylvania railroad at Crotherville, Ind., and Dayton, O.
400 tons, Rock Island Hospital Trust Co., Woonsocket, R. I.
375 tons, New York state bridges.
300 tons, viaduct, Chesapeake & Ohio railroad; Twelve Pole Creek, W. Va.
275 tons, office building, Springfield, Mass.; Burton E. Geckler architect, permit issued.
240 tons, building, Gibson Refrigerating Co., Greenville, Mich. Out for figures.
240 tons, building, Ternsted Mfg. Co., Detroit. Bids in.
200 tons, office building, Springfield, Mass., for Cheapside Land Co., permit issued to cost approximately $300,000.
160 tons, addition to City-County building, Seattle. Bids received.
150 tons, addition, Standard Electric Stove Co., Toledo, O. Bids in.
125 tons, steel tank and tower, Orange, Calif., Pittsburgh-Des Moines Steel Co. low bidder.
100 tons, building, Michigan Bell Telephone Co., Grand Haven, Mich. Bids in.
100 tons, Superior avenue station, Nickel Plate railroad, Cleveland. Bids in April 30.
100 tons, golf shaft building, American Fork & Hoe Co., Geneva, O. Bids in.
Unstated tonnage, addition to school, West Springfield, Mass. J. P. Keating Co,, Boston, general contractor on its bids of $150,900.

Concrete Bars

Awards Aggregate High—Aided By 2000-Ton Job—Much Work Pending

TOPPED by a 2000-ton exchange building at Seatle, concrete bar awards this week aggregate fairly well. A large amount of work is looming up to brighten prospects for a good summer. Many projects involve 500 to 1000 or 1200 tons and smaller jobs are growing more numerous. A dam in Tacoma, Wash., will take 2550 tons. Prices except a Chicago and Cleveland are firm.

REINFORCING BAR PRICES, PAGE 1205

Chicago, April 30.—Reinforcing bar tonnage in this district is slightly Heavier than in recent weeks. Several fair sized residential projects are pending in addition to some plant extension work in this district. Road building work also is increasing. Activity in residential building is more marked in reinforcing bars than in structural steel. Prices continue unsettled in the reinforcing bar market. Rail steel bar prices have not been strong recently at 2.00c and some billet business below 2.40c has been quoted.

Boston April 30.—Probably no more than 200 tons of concrete bars was awarded in the past week and these were small lots ranging from 25 to 60 tons apiece. The new gymnasium for Harvard university, however, will require 300 tons, while a storage warehouse at Somerville, Mass., will require 1200 tons, to be placed this week.

Pittsburgh, April 30.—Concrete bar awards show a moderate expansion in keeping with the more active inquiry rate noted recently. Most jobs still are limited to less than 100 tons at a time. The market is well maintained at 2.30c, Pittsburgh, for cut lengths and 2.05c for stock lengths, former prices of $1 a ton less having disappeared on new quotations.

Buffalo, April 30.—A Buffalo steelworks has been awarded a 335-ton contract of reinforcing bars for a vocational school. Large tonnage is pending for road construction with early covering indicated. Prices range from 2.565c, Buffalo, for carloads, to 2.90c for small lots delivered by truck on local jobs.

Cleveland, April 30.—Activity in the concrete bar market is more pronounced in connection with 40 to 60-ton jobs than in larger lots. However, occasional inquiries arise, which involve 100 to 300 tons at a time. Two jobs recently awarded Bourne-Fuller Co. aggregate 128 tons. An effort is being made to sustain the 2.25c, Pittsburgh, price level on cut lengths, but from time to time competition below that level is encountered.

Detroit, April 30.—Volume is lacking in concrete bar market and many bar fabricators are hungry for more work. While a number of small jobs are pending, projects of magnitude are scarce. The largest now up is the warehouse for the Peoples' Outfitting Co., Detroit, 1000 tons. The 350 tons for Newton Steel Co. plant at Monroe, Mich., went to Bourne-Fuller Co.

Awards Compared

	Tons
Awards this week	6,509
Awards last week	4,990
Awards last week	6,375
Awards this week in 1928	4,290
Average weekly awards, April	6,388
Average weekly awards, 1928	6,189
Average weekly awards, 1929	6,372
Total awards to date, 1928	132,676
Total awards to date, 1929	114.692

CONTRACTS PLACED

2000 tons, exchange building, Seattle, to Pacific Coast Steel Co.
900 tons, Sears Roebuck & Co., buildings at Buffalo, Syracuse and Rochester, N. Y., to Buffalo Steel Co., through Turner Construction Co.
400 tons, building at Pittsburgh, Sears, Roebuck & Co., Chicago, to Carlem Engineering Co.
350 tons, hotel, Bellingham, Wash., to Northwest Steel Rolling Mills.
350 tons, plant, Newton Steel Co., Youngstown, O., at Monroe, Mich., to Bourne-Fuller Co.
350 tons. courthouse, Birmingham, Ala., to Truscon Steel Co.; steel to be rolled by Tennessee Coal, Iron & Railroad Co.
335 tons, for Burgard vocational school, Buffalo, to Kalman Steel Co.
270 tons, factory building, Long Island City, N. Y., for Eppinger Securities Corp., to Fireproof Products Co.
250 tons, Ross building, Yakima, Wash., to

Northwest Steel Rolling Mills.

150 tons, Washington State Highway Viaduct, etc., to Northwest Steel Rolling Mills.

131 tons, plant, Consolidated Creamery Co., to Pacific Coast Steel Co.

128 tons, including 65 tons, unit No. 4, Northern Ohio Food Terminal Co., Cleveland; and bridge, East Seventy-first street, Cleveland Union Terminal Co., to Bourne-Fuller Co.

125 tons, miscellaneous work for western railroads, to Vierling Steel Works.

125 tons, store building, Marshall Field & Co., Evanston, Ill., to Inland Steel Co.

125 tons, Cushman Dam project No. 2, Tacoma, Wash., to unnamed interest.

120 tons, highway bridge in Union County, N. J., to Igoe Bros.

100 tons, apartment, 1301 Astor street, Chicago, to American System of Reinforcing.

100 tons, building at Sherman avenue and Foster street, Evanston, Ill., to Calumet Steel Co.

100 tons, apartment, Minneapolis, to Calumet Steel Co.

100 tons, apartment, Lakeside street, Oakland, Calif., to W. C. Hauck & Co.

CONTRACTS PENDING

2550 tons, Lake Cushman project, Tacoma, Wash. General contract awarded.

1500 tons, highway work, Missouri highway commission, Jefferson City, Mo.

1200 tons, Garfield street bridge, Seattle.

1000 tons, grain bins for Fisher Flouring Mills Co., Seattle. General contract to Teufel & Carlson.

1000 tons, First National Stores storage warehouse, Somerville, Mass.

1000 tons, warehouse, Peoples' Outfitting Co., Detroit. Bids in.

900 tons, County-City building, Seattle. Bids in.

500 tons, bank building, National Union Bank & Trust Co., Jackson, Mich. Bids in since April 15.

455 tons, warehouse, Port Commission, Oakland, Calif. Bids received.

400 tons for roadwork in Somerset County, N. J.

300 tons, Harvard gymnasium, Cambridge, Mass.

281 tons, paving in Sacramento county, California. Bids May 22.

275 tons, West Spokane street bridge approach, Seattle. Bids May 3.

230 tons, (mesh), for Orchard Park-Griffin Mills highway, Erie county, N. Y.; Liberto & Cerullo, Hamburg, N. Y., low bidder.

160 tons, locomotive sheds, Cleveland Union Terminal Co., Cleveland. Bids in April 30.

150 tons, theater, Continental Realty Co., Muskegon, Mich. Bids in.

150 tons, power house, Ashtabula, O., Cleveland Electric Illuminating Co., Cleveland.

130 tons, paving in Santa Clara county, Sacramento, Calif. Bids May 22.

103 tons, work for city of Los Angeles. Bids received.

100 tons, county bridge, Sumpes road, Parma, O. Bids in.

100 tons, apartment, 2000 Lake Park avenue, Chicago, McNally & Quinn, architects.

100 tons, canal project, Burley, Idaho. Bids May 8.

Fluorspar

Foreign Material Off 25 Cents—New Business Continues Fair

FLUORSPAR PRICES, PAGE 1206

New York, April 30.—Foreign fluorspar of 85 and 5 per cent grade has settled to a level 25 cents a ton lower than that recently prevailing. Foreign spar now brings $20.15, duty paid, tidewater, per gross ton, which is figured at $11.75 c.i.f. plus the duty of $8.40. In addition to bringing in spar on a large scale for delivery against orders booked early this year, new orders are being booked right along by the importers.

Rails, Cars

Car Awards Slacken—Pending List Presages Active May, Involving At Least 6500 Units

RELATIVELY light car buying is accompanied by active figuring on approximately 6300 freight cars and 200 coaches. Norfolk & Western let 500 automobile cars to its own shops and several smaller awards are noted. While Chicago & North Western may indefinitely postpone its large purchase, other lines contemplate early action. Rail buying is light; accessory orders fair.

RAILROAD TRACK PRICES, PAGE 1206

Chicago, April 30.—Cars pending in the western market include the previously reported 500 automobile cars for Union Pacific and 200 flats and 100 stock cars for the Northern Pacific. Chicago & North Western's purchase of 1000 to 2500 box cars may be postponed indefinitely. Northwestern Refrigerator Co. awarded 150 refrigerator cars.

Carbuilding shops specify for finished steel at a heavy rate but shipments have barely started on the tremendous tonnage placed this year.

The rail market is quiet. No fresh secondary tonnage has been warded.

New York, April 30.—Car buying in this district is relatively light, but with fairly good volume of business for builders to figure on. The Norfolk & Western placed 500 automobile box cars with its own shops. Locomotive buying comprises several orders for single locomotives.

Approximately 6300 freight cars and 200 coaches are involved in inquiries pending.

Detroit, April 30.—Odd lots of rails occasionally are bought by Pere Marquette, Wabash, Detroit, Toledo & Ironton, as well as the Detroit Street Railways. The most recent order placed by the latter involved 600 tons. A 500-ton lot for the road from Zug island to the site of the future plant of the Great Lakes Steel Corp. is being placed with a large interest.

CAR ORDERS PLACED

Baltimore & Ohio, 100 caboose car underframes, to American Car & Foundry Co.

Bureau of supplies and accounts, United States navy department, 50-ton gondola for Great Lakes navy station to Mt. Vernon Car & Mfg. Co.

General Electric Co., five steel underframe flat car bodies, to American Car & Foundry Co.

Norfolk & Western, 500 steel automobile box cars, to its Roanoke, Va., shops.

Northwestern Refrigerator Co., 150 refrigerator cars to American Car & Foundry Co.

Southern Pacific, 65 gondolas to own shops.

Manila railroad, 20 third-class passenger cars to American Car & Foundry Co.

Yankton, Norfolk & Southern, one gasoline-electric rail motor passenger and baggage car, to J. G. Brill Co.

LOCOMOTIVE ORDERS PLACED

A. M. Buyers Co., switch tank locomotive, to American Locomotive Co.

Calumet & Hecla Consolidated Copper Co., locomotive, to American Locomotive Co.

Cleveland Union Terminal Co., two electric locomotives, to American Locomotive Co. and General Electric Co.

Monessen Southwestern, switch engine, to American Locomotive Co.

New Cornelia Copper Co.,three switch engines, to American Locomotive Co.

Southern Pacific, 10 locomotives and 20 locomotive tenders to its shops at Sacramento, Calif., and Los Angeles.

James Stone Co., Corsicana, Tex., switch tank locomotive, to American Locomotive Co.

CAR ORDERS PENDING

Chicago, North Shore & Milwaukee, 25 suburban cars.

Fruit Growers Express, 150 refrigerator car underframes.

Hocking Valley, two club cars.

New York Central, 20 passenger car bodies and five passenger and baggage car bodies.

New York, Chicago & St. Louis, 500 steel automobile cars.

John A. Roeblings Sons Co., 10 90-ton steel gondola cars.

LOCOMOTIVE ORDERS PENDING

Canadian National, 12 switch engines for service on Grand Trunk Western.

Refractories Merger Has Set Up Offices

North American Refractories Co., a consolidation of six old established manufacturers of fire brick and related products, has set up its general offices in the National City Bank building, Cleveland. Most departments have already been centralized in Cleveland and others will rapidly follow.

The organization controls 15 plants with an annual production capacity of 155,000,000 units. Companies which were merged into the North American company are: Ashland Fire Brick Co., Ashland, Ky.; Crescent Refractories Co., Curwensville, Pa.; Dover Fire Brick Co., Cleveland; Elk Fire Brick Co., St. Mary's, Pa.; Farber Fire Brick Co., Farber, Mo. and Queen's Run Refractories Co., with three plants in Pennsylvania.

District sales offices are located in Boston, New York, Philadelphia, Pittsburgh, Chicago and Buffalo. Canadian sales offices are handled through a subsidiary, the North American Refractories Ltd., at Hamilton, Ont.

To care for less-carload needs of fire brick users of Cleveland and vicinity, the North American company has purchased the business of the Pennsylvania Refractories Co., with warehouse at 2877 East Thirty-seventh street, Cleveland.

The Market Section

Strip

Light Buying Under Present Heavy Commitments — Delivery Is Further Deferred

MAKERS of cold-rolled strip at Chicago have extended shipment dates to eight weeks, but at Pittsburgh mills have made some progress against heavy backlogs, because of lighter buying. Increased supply of semifinished steel would aid eastern mills in meeting requirements of users. Automotive buying has not yet declined materially. Prices are unchanged.

STRIP PRICES, PAGE 1206

Chicago, April 30.—Cold rolled strip mills are forced to extend shipments to about eight weeks. Automotive schedules during April showed little decline from March but it is probable May orders will taper. Specifications are fairly heavy against second quarter contracts, but are only moderately active. No prices have appeared for third quarter but it is indicated quotations will be named earlier this year because of the extension of shipments nearly to the beginning of third quarter. Prices now named for spot and forward business are 2.75c to 2.85c, Cleveland-Pittsburgh base.

New York, April 30.—On account of most current requirements in strip steel being taken care of with tonnage shipped against runovers of first quarter contracts, new business in strip is not large. Fair tonnage, however, now is being placed. This shows prices well held. Hot rolled strip steel is bringing 1.90c, base, Pittsburgh, for 6 to 24-inch widths, and 2.00c for widths under 6 inches. Cold-rolled strip steel is bringing 2.75c to 2.85c, base, Pittsburgh. Mills have good backlogs, and it is especially difficult to get early shipment of narrow widths.

Philadelphia, April 30.—Wide strip continues sold up six to eight weeks and 2.10c, base, Pittsburgh, on blue annealed basis, is firm. Consumption continues good although the automobile trade is not specifying as actively for May and June. On new business prices are firm at 1.90c to 2.00c, Pittsburgh, for hot and 2.75c to 2.85c for cold.

Pittsburgh, April 30.—Backlogs of hot and cold-rolled strip steel producers suffered during April as the result of the decline in buying following heavy purchases in closing out first quarter contracts during March, but the decrease was smaller than was expected. Unfilled business still is large and most producers are asking late June delivery on narrow sizes of hot strip. This extended shipment partly is predicated on difficulties in obtaining sufficient semifinished steel, and an increase in the available supply of such material might shorten delivery dates. Rate of buying by automotive interests has not declined materially from the recent peak, although some note a more cautious tendency. Producers report no difficulty in obtaining full quoted prices of 1.90c and 2.00c, Pittsburgh, for the two sizes of hot strip, and 2.75c to 2.85c for cold-rolled material.

Cleveland, April 30.—Deliveries on hot strip are now well into July in a number of cases. This represents second quarter tonnage but mills will have to deliver it early in third quarter at this quarter's price, 1.90c to 2.00c, Pittsburgh. While automotive tonnage shows signs of slight recessions in June, July and August, other users are increasing their tonnage. Cold strip deliveries usually are four or five weeks deferred. The 2.75c, Cleveland-Pittsburgh, price is well observed.

The Nonpareil Mfg. Co., Chicago, has been incorporated to manufacture and deal in bearings, etc.

Cold Finished Steel

Tonnage Holds Up Well in Spite of Advance

COLD FINISHED PRICES, PAGE 1206

Pittsburgh, April 30.—Cold finished bar producers enter May in a comfortable position. April tonnage of new business approximated shipments for most producers despite the price advance instituted this quarter, which induced some anticipatory buying in March. Backlogs consequently have been reduced little during the past 30 days although unfilled business is not overly large. The market is well maintained at 2.30c, Pittsburgh.

High Speed Steel Up

Ludlum Steel Co., Watervliet, N. Y., has increased its base price on high-speed steel 5 cents per pound, effective on orders made after May 1 and on shipments made after July 1. High-speed steel has nominally been at 65 cents per pound, distribution base, but sharp competition has developed lower prices. Increasing cost of ores is given as the reason for the rise.

Youngstown Sheet & Tube Co. has moved its office at Seattle to room 409, Central building.

Wire

April Demand Shows Spring Expansion — Manufacturers' Wire and Fencing Add to Volume

TONNAGE of wire is increasing as farm work advances. Fencing is taking increasing tonnage and manufacturers have maintained their high volume of requirements. Automotive demand is at a high level. Nails are in better demand also, but only to a slight degree. Prices are steady and show no tendency to weaken. Jobbers are moving stocks more actively.

WIRE PRICES, PAGE 1206

Chicago, April 30.—Tonnage increases in woven fencing and merchants' wire feature wire products. Jobber stocks in the farming districts were drained to a much lower point during the week and mill orders from jobbers are heavier. Manufacturers' wire is steady, but specifications are not at the peak rate of the first quarter. The outlook is particularly good for agricultural sections. The market on wire products to large jobbers is reported steady on the basis of 2.55c, Chicago or western mills, for bright plain wire, and $2.70 for wire nails.

Worcester, Mass., April 30.—In addition to steady specifications against contracts at firm prices, spot buying covering a fair range of wire materials shows improvement. Mill stocks are generally lower and the tone of the market indicates that large jobbers have cleared their floors better than expected. Specialty materials are moving well while manufacturers wire shows only slight recession. Export trade is also a factor. Plain wire continues at 2.75c, Worcester base, to dealers.

Pittsburgh, April 30.—April sales of wire products showed a moderate expansion over March. Demand for fencing material gradually is expanding although nails have improved only slightly. A steady demand for manufacturers' wire prevails with automotive buying holding to its recent high level. Improved weather conditions are having an effect on both fencing and nails although stocks built up during the latter part of the fourth quarter have not been materially depleted. A steady tone continues in prices, with plain wire holding at 2.50c to 2.60c, Pittsburgh, and wire nails at $2.65 to $2.75.

Nonferrous Metals

All Quotations Tend Toward Stability Despite Very Light Demand—Copper Sales Are in Small Lots but Deliveries Heavy

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin—New York Spot	Straits Tin—New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
April 24	18.00	18.07½	17.62½	44.87½	44.87½	7.00	6.85	6.55	23.90	9.50	35.00
April 25	18.00	18.07½	17.62½	44.12½	44.12½	7.00	6.85	6.55	23.90	9.37½	35.00
April 26	18.00	18.07½	17.62½	43.87½	43.87½	7.00	6.82½	6.55	23.90	9.37½	35.00
April 29	18.00	18.07½	17.62½	44.00	44.00	7.00	6.82½	6.55	23.90	9.37½	35.00
April 30	18.00	18.07½	17.62½	44.31¼	44.43¼	7.00	6.80	6.60	23.90	9.37½	35.00

NEW YORK, April 30.—Prices of nonferrous metals have been somewhat more stable in the past week but new business continues extremely quiet. Small lot buying of copper is being done in a routine way from day to day. Buying of lead was of good size several days ago but in the past few days it has been extremely small. Buying of zinc has been unusually light for several weeks. Buying of tin also continues light though now and then days of fair sales are reported. This metal has not become stabilized as the others but fluctuates rapidly near the 44-cent level. Shipments of all metals continue near record rates.

Copper—Domestic users are buying small lots at 18.00c, Connecticut, for all positions from prompt to August. A large quantity might be difficult to locate at the going price. All business is going to custom smelters, while other producers continue to stay out of the market, partly because they are very well booked into the summer and partly as a matter of policy to let the custom smelters get enough business to balance the latter's unsold intake. Export sales are also light. April shipments are expected to be very nearly as large as the record-breaking movement in March.

Zinc—Sales of prime western have been extremely light since the market touched 6.80c, East St. Louis, last month. Consumers appear to have covered practically all their needs for several months ahead. The result has been that a very small tonnage of resale metal pressed the price down to 6.50c, and has not sold readily even at this great reduction. Meanwhile, small scattered lots have sold at a variety of prices between this figure and 6.80c. Most of the resale metal has been cleaned up so that the market now stands about 6.60c, at which price some smelters will sell, while most of the smelters are out of the market, quoting nominally 6.80c.

Tin—This market continues to be extremely uncertain, with a feeling in many quarters that the price is going to go lower. The dip recently to a little under 44.00c was the lowest in several years and about on a par with pre-war prices. Consumption is setting a new record in this country and is very large in England, world output also is running larger than ever before. The result is that abundant stocks are available to meet demand. Sellers frequently are more anxious than buyers to do business.

Lead—Fair buying was done recently for April shipment, but in the past few days new business has been light. The St. Louis price has been shaded slightly. It is thought that more buying has to be done for May, but present market conditions cause buyers to think that they can hold off as long as they like.

Aluminum—New business is of moderate size but shipments continue large against old orders. Prices are unchanged and firm.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	$10.25
Zinc strip (100-pound base)	$9.25
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	12.00 to 12.50
Chicago	11.50-nominal
Cleveland	11.00 to 11.50
HEAVY YELLOW BRASS	
Cleveland	8.00 to 8.50
ZINC	
New York	3.50 to 3.75
Cleveland	3.25 to 3.50
HEAVY COPPER AND WIRE	
New York	14.00 to 14.25
Boston	13.50 to 14.00
Chicago	12.50-nominal
Cleveland	14.00 to 14.25
RED BRASS BORINGS	
New York	11.00 to 11.50
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.50
LIGHT COPPER	
New York	12.00 to 12.25
Chicago	11.50-nominal
Cleveland	12.00 to 12.50
LIGHT BRASS	
Boston	8.00 to 8.50
Chicago	7.50-nominal
Cleveland	7.00 to 7.25
ALUMINUM	
Clippings, Cleveland	18.00 to 18.50
Borings, Cleveland	9.50 to 10.00
Cast, Cleveland	12.75 to 13.00
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	17.00 to 17.50
Brass ingot, 85-5-5-5	16.25 to 16.50

Coke By-Products

Producers Operate on Narrow Margin of Supplies—Prices Steady

New York, April 30.—While sellers are able to meet brisk demands for light oil distillates, surplus stocks in most cases are light. This applies particularly to toluol, still being consumed in large quantities by paint and lacquer manufacturers. Prices generally are unchanged.

Spot demand for sulphate of ammonia is slack, although surplus supplies are not heavy, as specifications continue to come out freely against the long-time contracts. Some sellers now look for these specifications to come out in fairly good volume up until May 15 and possibly longer.

Prices on ball and flake naphthalene are unchanged, with the drug trade placing substantial business by way of rounding out its spring cleaning season requirements.

Coke Oven By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure Benzol	$0.23
90 per cent benzol	0.23
Toluol	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.05½ to 0.06½
Naphthalene balls	0.06½ to 0.07½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.30

Mercury Is Quiet, Easy

New York, April 30.—Quicksilver is quiet and easy at $123 to $123.50 a flask.

Warehouse

Extended Mill Deliveries Shove Warehouse Totals High—April Exceeds March Totals—Cleveland Sheet Prices Change

EXTENDED mill deliveries continue to be of aid in expanding warehouse business. April tonnage exceeds March in a number of districts by at least 10 per cent. Prices generally are unchanged, although at Cleveland, black and galvanized sheets advance with a change in quoting methods. St. Louis warehouses benefit by flood conditions.

New York—Jobbing demand continues brisk, with a sharp increase in buying of black and galvanized sheets. Several large individual orders have been booked by one leading seller, reflecting the sold-up condition of the mills. In point of volume, however, structurals still top the list. Prices are strong, but unchanged.

Pittsburgh—Sales show little change compared with the early April rate and approximate, if not slightly exceed, the comparable March volume.

Buffalo—April business was better for Buffalo warehouses than any month this year. Demand was broad and shipments indicated that all consumers were large purchasers. Resumers were large purchasers. May outlook is good.

Cleveland—Effective May 1 leading sheet jobbers have advanced black and galvanized sheets, changing their method of quoting these two grades slightly. The new figures are 3.90c and 4.75c, respectively, less 15 cents when more than 10 bundles are ordered at once for delivery at one time. April shipments exceed March by possibly 10 per cent.

Detroit—Buying from warehouses has shown considerable increase the latter half of the month and for some April tonnage will exceed March. Prices are unchanged although a rise shortly is expected in pickled sheets.

Cincinnati—April was a better month for warehousemen in this area than March. With the advent of good weather outside work increased and buying became fairly brisk. Prices continue unchanged.

Philadelphia—Jobbers report an exceedingly heavy demand for corrugated sheets, with premiums being obtained in some instances. Otherwise current demand is less spectacular but good. Prices are unchanged.

St. Louis—While weather conditions have been unfavorable for merchandising by iron and steel warehouses, business as a whole continues good, with prices through the list holding steady to firm. Two leading jobbers report a heavy call for emergency goods for use in connection with flood damage, including track materials and corrugated roofing.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York†††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.90c
Cincinnati	3.15c
Cleveland	2.25c to 2.44c
Detroit	2.30 to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.90c to 3.30c
Philadelphia	2.75c to 3.10c
Pittsburgh	2.90c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York†‡	3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York†‡	3.90c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.35c to 3.45c
San Francisco	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore	3.50c to 4.00c
Boston	4.85c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland***	3.90c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York	3.90c to 4.00c
Philadelphia*†	4.10c
Pittsburgh**	3.85c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.30c to 4.50c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland***	4.75c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York	4.75c
Philadelphia*†	4.85c
Pittsburgh**	4.85c to 4.95c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	5.10c
St. Paul	4.90c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit, 3/16-in. and lighter	3.30c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York†‡	3.75c
Philadelphia*	3.15c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York†‡	4.25c
Philadelphia*	3.40c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons, squares	Flats, squares
Baltimore (c)	3.50c(a)	4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.60c	4.10c
Philadelphia*	3.60c	4.10c
Pittsburgh	3.70c	4.20c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.15c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, round	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. †† Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Quiet Prevails in Coast Markets, with Much Business in Prospect

ALTHOUGH building operations along the entire Pacific coast are active, a lull in awards has come about and only small lots are being placed. Producers have sufficient work on hand to bridge the slack spot. Prices are holding well in all lines. A large number of projects are almost ready for bids and awards promise to come in a short time.

San Francisco, April 27.—(*By Air Mail*)—General construction work on the Pacific Coast is holding up well, compared with last year. So far this month over $10,000,000 of new industrial plants and factories have been planned and awards of offices, apartments, schools, hotels, warehouses and factories total over $18,000,000. Important developments of the week include the call for bids for 1300 tons of plates for a pipe line in Oakland and the award of 4000 tons of structural shapes for two buildings in Los Angeles.

Pig Iron and Coke

Foundry pig iron and coke are quiet, sales and inquiries being limited to relatively unimportant tonnages. No change in quotations are noted.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

While a fair tonnage of concrete bars is pending, awards this week totaled only 344 tons. The largest letting called for 125 tons for a dam at Tacoma. The California state highway commission will open bids next month on 642 tons for three paving projects. An award of 455 tons for a warehouse in Oakland is expected to be made during the next few days. Prices on carload lots from warehouse continue at 2.30c base with 2.60c applying on smaller lots. Demand for merchant bars is limited to small lots of numerous sizes. On this class of material 2.35c, c.i.f., appears fairly firm.

Structural steel shape awards this week aggregated 5463 tons and brought the total for the year to 67,349 tons as compared with 56,180 tons for the corresponding period in 1928. This week's total was the largest in over six weeks. The Consolidated Steel Corp. took 2000 tons each for the Federal Reserve bank and May's department store in Los Angeles. A warehouse in Honolulu involving 375 tons was booked by the California Steel Co. Pending business exceeds 16,000 tons. Approximately 6800 tons is still pending for two passenger ships for the Matson Navigation Co. No change in prices on plain material is noted and 2.35c c.i.f. is firm.

Other Finished Material

Cast iron pipe awards this week were limited to a total of 607 tons. So far this year 34,840 tons have been placed, compared with 33,505 tons for the same period last year. The American Cast Iron Pipe Co. took the only award over 100 tons.

Small Orders Are Rule

Seattle, Wash., April 24.—No large awards featured the Pacific Northwest iron and steel market this week but conditions are reported satisfactory as there is a heavy volume of small orders and not a few large contracts are up for immediate action.

Prices are firm and spring buying is developing in normal volume although some items are backward. General conditions are good. Construction activity continues general throughout this territory.

Bars, Plates and Shapes

Mill prices are firm and unchanged on merchant bars, plates and shapes at 2.35c and reinforcing materials at 2.30c.

The two local steel mills have sufficient work for a considerable period. Recent business has included many orders of less than 100 tons and several important contracts are pending. Awards of concrete bars this week totaled 2500 tons. The Northwest Steel Rolling Mills took 250 tons for the 7-story Ross building, Yakima, 150 tons for state highway work and the Crown building, Seattle, and 100 tons for the Doneen building, Wenatchee. Pacific Coast Steel Co is furnishing reinforcing materials for the Exchange building, Seattle, although the contract for 2000 tons is said not yet to have been officially awarded. Business pending includes 900 tons for the County-City building, 2550 tons for the Lake Cushman project, 1000 tons for grain bins for the Fisher Flouring Mills Co., Seattle, 700 to 1200 tons for the Garfield street bridge, Seattle, and 275 tons for the West Spokane street bridge approach, Seattle.

The Central Iron & Steel Co., Harrisburg, Pa., has moved its New York headquarters to 25 Broadway. R. H. Maddocks is New York district sales manager for the company.

Steel Institute Papers Are Announced

New York, April 30.—The thirty-fifth general meeting of the American Iron and Steel institute will be held at the Hotel Commodore in New York, May 24. There will be the usual sessions in the morning and afternoon devoted to the reading of technical papers and the banquet will be held in the evening. A feature of the banquet will be the first annual award of the Gary memorial medal which by decision of the directors of the institute will be presented to James A. Farrell, president of the United States Steel Corp. and vice president of the American Iron and Steel institute.

Papers to be read at the meeting are as follows:

"Past, Present and Future of Illinois Coals," by Prof. S. W. Parr, University of Illinois, Urbana, Ill.

"Silica as a Refractory in the Steel Industry," by R. B. Sosman, research department, United States Steep Corp., New York.

"The Use of Blast Furnace and Coke Oven Gas in Open-Hearth Furnaces," by Frank H. Leahy, Youngstown Sheet & Tube Co., Youngstown, O.

"Large Open-Hearth Furnaces," by Frank A. King, superintendent, open-hearth department, Weirton Steel Co., Weirton, W. Va.

"The Theory and Application of Regentrative Principles in the Steel Industry," by T. J. McLoughlin, fuel engineer, Duquesne Works, Carnegie Steel Co., Duquesne, Pa.

"Some X-Ray Studies of Cold Worked Steel," by F. C. Elder, chief metallurgist, American Steel & Wire Co., Cleveland.

"Functions of Steel Plant Metallurgy," by R. E. Sherlock, metallurgical engineer, Donner Steel Co., Buffalo.

Amalgamated Is Framing Wage Demands

Pittsburgh, April 30.—The Amalgamated Association of Iron, Steel and Tin Workers in convention at Canonsburg, Pa., is considering recommendations of the associations wage committee.

The puddlers' wage committee asks a minimum wage rate of not less than a 2-cent card. Tin mill workmen are proposing that they be paid on the same basis as for rolling plain sheets on sheet mills. They also ask a wage advance of 10 per cent to tinners, redippers and risers on all combination tin and lead stack and also to tinners and risers on all T and W machines.

In the sheet and jobbing division a wage advance of 10 per cent is asked for matchers and doublers. When No. 13 gage or lighter is worked in single piece on jobbing mills, it is asked that 20 per cent extra be paid the crews. A second catcher asked on rolls 42 inches wide and over, regardless of the orders worked. A 6-hour turn June 1 to Sept. 1 is proposed for sheet and tin mill workmen.

It is expected that representatives of the mills and of the Amalgamated association will meet, probably at Atlantic City, N. J., between May 15 and June 1. The present scale expires June 30.

Steel Corporation's Profit Shows Increase

Net earnings for March reported by the United States Steel Corp amounted to $22,265,342, compared with $15,453,146 for March, 1928, and $17,128,633 for the same month in 1927. The net earnings for the first quarter of this year amount to $60,105,381, against $40,934,032 in the first quarter of 1928 and $53,186,679 in 1927. The net profit for the first quarter was $42,185,447, against $21,331,871 in the comparable period of 1928. The net profit for the quarter is equal after preferred dividends to $5.04 a share on 7,116,235 common shares, against $3.43 a share in the previous quarter, and $2.11 a share in the first quarter of 1928. Monthly total earnings compare as follows:

	1929	1928
January	$18,759,098	$11,899,549
February	19,080,941	13,581,337
March	22,265,342	15,453,146

Expect New Tariff Bill Late This Week

Washington, April 30.—A meeting of the full membership of the house ways and means committee has been called for Thursday afternoon of this week finally to complete the proposed new tariff bill.

Democratic members of the committee are included in the call, and when minority members sit in on the final draft of a bill it is a certain sign that the bill has been completed.

Should this meeting not be postponed it is regarded as almost certain that the bill will be available the latter part of this week.

One of the members of the tariff commission who has been in close conference with the committee during the drafting of the bill stated today in regard to the metal schedule that "there are some upward and some downward changes in rates but the schedule will cause much disappointment."

Calls Preliminary Scrap Meeting May 13

Washington, April 30.—The federal trade commission has called a conference at the Wardman Park hotel, Washington, May 13, for representatives of consumers of iron and steel scrap, the trade relations committee of the Institute of Scrap Iron and Steel Inc. and Benjamin Schwartz, director of the institute, to consider a program for the trade practice conference of scrap iron and steel dealers called for Pittsburgh, May 23.

The recommendations discussed at this preliminary conference here will be submitted to the conference at Pittsburgh. An attempt will be made to set up a code which will improve practices of the scrap industry and foster better relations between scrap dealers and consumers.

Pressed Metal Institute Names New Officers

At the annual meeting of the Pressed Metal institute at Detroit, April 26, Lee O. Benner, sales manager, pressed steel division, Motor Wheel Corp., Lansing, Mich., was elected president for the coming year. Harvey S. Johnson, assistant sales manager, Bossert Corp., Utica, N. Y., was made vice president, while George D. Shanahan, general manager, Motors Metal Mfg. Co., Detroit, and W. H. Schomburg, vice president, Bingham Stamping & Tool Co., Toledo, were made members of the executive committee.

The meeting was addressed by F. Richmond Fletcher, Scovell Wellington & Co., on the subject. "Making the Most of Your Cost Finding Methods."

After a discussion of predetermining the drawing qualities of steel, it was decided to appoint a committee to secure from every source information on the subject and to see what might be done in co-operation with others in securing more definite data on the subject. The convention also discussed the possibilities of increased business through redesign and development.

Lee H. Hook Dies

Lee H. Hook, 51, works manager of the Calumet Steel Co., at Chicago Heights, Ill., died April 26, following a 6-month's illness. He had been works manager for 20 years and previously had been connected with the Inland Steel Co.'s rail steel bar mill at Chicago Heights. He served three terms as mayor of Chicago Heights and also had been city treasurer and park commissioner.

Sheet Prices Are Firmer

(*Continued from Page* 1213)

all gages. The new extra will be $1 for No. 17 gage and lighter, whereas for No. 16 gage and heavier the extra will remain unchanged at 75 cents. On single pickled sheets, which in the past were known as single pickled one-pass cold-rolled, the extra was 50 cents and on single pickled, full cold rolled the extra was 60 cents. In the future these extras will be combined into single-pickled, cold-rolled, on which the extras will be as follows: No. 17 gage and lighter 65 cents, and on No. 16 gage and heavier 50 cents.

No sign appears of a letup in demand for general sheet mill products. Monday's mail brought 13,000 tons of new orders to one mill interest. Common black sheets continue 2.95c, Pittsburgh, autobody 4.10c, blue annealed 2.20c, and galvanized 3.70c.

Pig Iron

(*Concluded from Page* 1207)

Montreal. Final figures may show April shipments slightly ahead of March, and it is indicated the April daily rate exceeded that of March. April shipments come close to establishing a record for that month. Spot and future sales of northern iron are being made at $20, base, Chicago furnace, except lake cargo iron offered at a price figuring about 50 cents under Chicago base price.

Cincinnati, April 30.—New business in northern and southern pig iron has been light during the past week. A Michigan melter wants 1500 tons of northern iron for last half. An Indiana buyer is inquiring for 500 tons of high silicon iron. One northern dealer reports total sales of 1200 tons. A few small orders for third quarter have been placed. Prices are steady.

St. Louis, April 30.—Activity in pig iron centers in shipments, while new purchasing is light. Preliminary reports indicate that April shipments were the largest of any month on record in this district. The melt is gaining moderately. The leading local producer reports small sales for third quarter. The total of sales reported in the past week is around 10,000 tons, the largest single transaction being 6000 tons of basic for a nearby Illinois steelmaker. A specialty maker in Illinois engaged 900 tons. Prices are firm.

Birmingham, Ala., April 30.—Small sales of pig iron do not appear to be strengthening the market. Production has been reduced, Sloss-Sheffield Steel & Iron Co. blowing out one of its North Birmingham furnaces. Much iron in on furnace yards. Local consumption shows no change. While some iron is moving to the North and East, these shipments are far from affecting the general market. The price here is given as $15.50, base, Birmingham. The Alabama public service commission has granted railroads the right to reduce rates on iron ore from mines to blast furnaces 10 cents a ton. This will mean 40 cents less cost in making a ton of pig iron.

Toronto, Ont., April 30.—Further slight advances in pig iron prices went in effect in the local market in the past week. The advance was an upward spread of 50 cents per ton. Montreal prices, however, were unchanged. Toronto prices now are $24.10 to $24.60, for foundry iron.

Philadelphia, April 30.—Recent orders for basic iron aggregate about 5000 tons. Good sales of foundry iron are made occasionally, but the total is small. The price of $21.50, base, eastern Pennsylvania furnace, is firm.

April Pig Iron Rate Is Slightly Below March; Net Gain of 3 Stacks

PRELIMINARY estimates of coke pig iron production in April give a daily rate of 118,154 gross tons. This is a reduction of about 1 per cent from the 119,622-ton rate of March and is so close to the record for April —118,210 tons in 1923—that final and revised statistics may prove the month to have been a record April after all.

The estimated total for April is 3,544,620 tons, which compares with 3,709,518 tons in March and the record 3,546,308 tons of April, 1923.

Unquestionably production of pig iron in the first four months of 1929, 13,905,542 tons with April estimated, is a record for the period. Compared with the 106,066-ton rate and the total of 3,181,975 tons of April, 1928, last month reveals a decided gain.

It is paradoxical that although the daily rate of production shrank slightly in April, three more stacks, or a total of 216, were in blast as of April 30. This is the greatest number of stacks active since April, 1927. In the month 8 steelworks stacks were lighted and 4 were blown out, 1 merchant stack was lighted and 2 were blown out. The ferrophosphorus stack at Rockdale, Tenn., is now in blast.

If the April rate of pig iron production were maintained all year, the 1929 total would approximate 43,125,000 tons. The record output of pig iron in any year is 40,025,850 tons in 1923.

MONTHLY PRODUCTION

	1929	1928	1927	1926
Jan.	3,433,028	2,855,515	3,101,346	3,319,789
Feb.	3,218,376	2,898,668	2,940,604	2,923,850
Mar.	3,709,518	3,199,175	3,482,107	3,458,171
April	3,544,620	3,181,975	3,424,377	3,438,805
Total 4 mos.	13,905,542	12,135,333	12,948,434	13,140,615
May		3,292,790	3,391,067	3,477,820
June		3,082,340	3,089,726	3,232,478
July		3,072,711	2,954,625	3,224,663
Aug.		3,136,995	2,950,674	3,200,723
Sept.		3,063,593	2,782,500	3,163,269
Oct.		3,373,589	2,812,015	3,334,206
Nov.		3,304,656	2,661,863	3,237,992
Dec.		3,369,784	2,698,208	3,089,175
Total		37,831,741	36,289,112	39,100,941

APRIL PIG IRON PRODUCTION

	No. in blast last day of month April	March	—Totals— April	March
Ohio	46	46	807,150	835,704
Pennsylvania	78	74	1,227,389	1,234,994
Alabama	17	18	222,945	244,061
New York	16	16	244,264	245,403
Illinois	20	20	289,833	397,716
Colorado	2	3		
Indiana	16	16		
Maryland	6	6	517,056	538,750
Virginia	1	1		
Wisconsin	0	0		
Kentucky	1	1		
Massachusetts	1	1		
Tennessee	2	1	101,864	103,086
Utah	1	1		
West Virginia	3	3		
Michigan	4	4		
Minnesota	2	2		
Missouri	0	0	88,734	71,807
New Jersey	0	0		
Texas	0	0		
Spiegel and ferro—all states	....	....	45,385	37,997
Total	216	213	3,544,620	3,709,518

Rate of Operation

(Relation of Production to Capacity)

	1929†	1928*	1927‡
January	80.3¶	67.8	71.2
February	83.3¶	73.6	74.7
March	86.7¶	76.1	79.8
April	85.6	78.0	81.2
May		78.3	77.7
June		76.0	73.2
July		73.2	67.7
August		74.4	67.6
September		75.2	65.9
October		80.1	64.5
November		81.1	63.0
December		80.2	61.8

†Based on capacity of 50,367,665 tons as of Dec. 31, 1928. *Based on capacity of 59,605,720 tons. ‡Based on capacity of 51,379,400 tons. ¶Revised. Capacities computed by American Iron and Steel institute.

AVERAGE DAILY PRODUCTION

	1929	1928	1927	1926	1925
Jan.	110,742	92,113	100,043	107,039	108,781
Feb.	114,942	99,954	105,021	104,423	114,788
Mar.	119,662	103,199	112,326	111,554	115,207
Apr.	118,154	106,066	114,146	114,627	107,041
May		106,219	109,388	112,187	94,642
June		102,745	102,991	107,749	89,301
July		99,120	95,311	104,021	85,976
Aug.		101,193	95,183	103,249	87,328
Sept.		102,120	92,750	105,442	90,862
Oct.		108,824	90,710	107,555	97,351
Nov.		110,155	88,728	107,933	100,775
Dec.		108,702	87,039	99,651	104,808
Ave.	115,880	103,365	99,422	107,126	99,645

Ingots and Castings in Good Gain in 1928

Steel ingots made in 1928, according to figures just announced by the American Iron and Steel institute, totaled 50,325,393 tons, and a gain of 6,548,676 tons, or 14.9 per cent, over the 43,776,717 tons made in 1927. Steel castings production was 1,218,787 tons, against the 1927 total of 1,158,468 tons, the gain being 60,319 tons, or 5.2 per cent. Alloy steel ingots aggregated 3,045,225 gross tons and alloy castings, 169,684 tons.

Finished rolled iron and steel totaled 37,662,916 gross tons and increased 4,783,885 tons, or 14.5 per cent, over the 1927 output of 32,879,031 tons. Of the total, iron and steel rails accounted for 2,647,493 tons; plates and sheets, 11,006,050 tons; wire rods, 3,080,816 tons; structural shapes, 4,096,143 tons; nail plate, 16,200 tons; and all other finished rolled material, 16,816,214 tons.

Iron and steel concrete bars amounted to 951,888 gross tons; skelp, 3,368,973 tons; hot-rolled strip, 2,161,988 tons; tin and terne plate, 3,951,038,756 pounds; forged iron and steel, 625,382 tons; wire nails, 14,234,073 100-pound kegs; cut nails, 619,784 kegs; wrought pipe and boiler tubes, 2,923,910 tons; seamless tubes, 1,078,927 tons; and cast pipe, 1,872,020 net tons.

The complete report of the institute with comparisons with 1927 will be presented in the May 9 issue of IRON TRADE REVIEW.

Buys McMyler Co.

Industrial Brownhoist Corp., Cleveland, has purchased the McMyler-Interstate Co., Bedford, O. The McMyler plant, machinery and materials are not included in the purchase, but manufacturing operations, business, drawings and records are to be moved to the Cleveland plant of the corporation. Through the purchase of the McMyler company, Industrial Brownhoist acquires products supplementary to its own. Industrial Brownhoist, with plants at Cleveland, Elyria, O., and Bay City, Mich., makes a complete line of locomotive cranes, crawler shovels, pile drivers, bridge cranes and other types of material handling equipment.

Transfer Chief Engineer

R. H. Stevens, chief engineer of the Cambria plant of the Bethlehem Steel Co., has been transferred to its Sparrows Point, Md., plant and has been succeeded by William C. Frank, formerly assistant chief engineer. Mr. Stevens formerly was chief engineer of Edgar Thomson works of the Carnegie Steel Co., and later was chief engineer of the Midvale Steel & Ordnance Co., Philadelphia.

No Decline at Buffalo

Buffalo, April 30.——There is no slackening of billet production in this district. Day to day operations of steelworks finds 32 to 33 open hearths of 37 in production. Operations in the larger steelworks are as near capacity, from open hearth standpoint, as working conditions will permit.

Metal Trades Report Favorably on Future Business Outlook

More Than 1000 Plants Represented at Thirty-first Annual Meeting of National Metal Trades Association — Officers Are Re-elected

FURTHER extensive research into business and economics, labor relations and problems of business management were mapped out at the thirty-first annual convention of the National Metal Trades association, April 24-25, at the Drake hotel, Chicago.

Encouraging reports were heard on the business outlook and existing business conditions among the member companies, as well as on labor conditions and progress in employe training, tending to build up a skilled labor reservoir. Member plants experienced virtually no labor trouble, as in some years previously, although the scarcity of skilled labor in some lines was described as presenting a serious problem. Reports on the growing tendency of business to regulate its own affairs were featured.

With the convention was held an interesting exhibit of apprenticeship training work, sponsored by the Chicago branch. The exhibits, consisting of machining, die, tool and pattern making and internal grinding, with shop drawings and working plans, were in charge of apprentice boys, who assisted in demonstrating the Chicago group training methods. Manufacturers held several small exhibits in rooms of the hotel.

Registration was the largest of any previous convention, the attendance with visitors having represented more than 1000 plants. Tuesday and Friday were taken up with plant visits in the Chicago district. The annual banquet Wednesday evening was addressed by Francis H. Sisson, vice president, Guaranty Trust Co., New York, on "The Problems of Prosperity."

Make Progress in Plant Foremanship Programs

THE department of industrial education of the association announced an advanced foremanship training course, and the setting up of individual plant programs for foremanship and apprenticeship training. Unit instruction sheets, which may tend to standardize methods of apprenticeship training, both in the shop and classroom, are being prepared. Important progress was reported in the training of foremanship conference leaders by the group method. During the year 10 conference groups were trained, 83 proficient leaders were developed, and 40 plant foremanship programs were put under way. Many other programs were set up by member companies. A general apprenticeship survey was made for the establishment of community programs. Classes in foremanship training under the association's auspices alone comprise over 2000 members.

The committee on industrial relations reported that field men of the association in the last year visited more than 200 member shops at their request, and issued several hundred special reports. In many instances, the committee reported, the most valuable part of the work has been that of assisting members to avoid mistakes previously made by others. An advisory council on industrial relations also has been created, comprising six specialists in industrial relations, who will assist the field men in conducting special research. This committee is assisting in providing more skilled labor. The report stated that the growing introduction of machinery does not replace wage earners to any alarming extent, and that such charges reflect a lack of understanding of industrial trends, inasmuch as each machine represents in operation or in its creation the work of toolmakers, die and pattern makers, internal grinders, designers and others, whose creative usefulness must be back of every machine.

The committee on prevention of industrial accidents has started a new bulletin service known as "Shop Safety." During the year 150 plants were visited. The safety work afforded protection also to tools and equipment against abuse and loss of time in operation. An engineering serv-

New Officers

NATIONAL METAL TRADES ASSOCIATION

President
HAROLD C. SMITH*
President, Illinois Tool Works, Chicago

First Vice President
J. G. BENEDICT*
General manager, Landis Machine Co., Waynesboro, Pa.

Second Vice President
JACOB D. COX JR.*
President, Cleveland Twist Drill Co., Cleveland

Treasurer
J. W. O'LEARY*
President, Arthur J. O'Leary & Son Co., Chicago

Advisory Council Members
CHARLES D. WIMAN
President, Deere & Co., Moline, Ill.
W. D. HAMERSTADT
President, Rockwood Mfg. Co., Indianapolis
ALEXANDER SELLERS
President, William Sellers & Co. Inc., Philadelphia
H. S. CHAFEE
Treasurer, Builders Iron Foundry, Providence, R. I.
W. LEDYARD MITCHELL*
Vice president, Chrysler Corp., Detroit
J. A. SHELDON*
Works manager, Willys-Overland Co., Toledo, O.

*Re-elected.

ice of the committee acts in relation to compensation insurance, and the total indicated annual savings in compensation insurance premiums during the past three years was reported at $26,000. The Ohio workmen's compensation law was criticized.

The membership committee reported nearly 1100 members, with 89 applications for membership. The association now has 30 branches. The membership is the largest in the history of the organization. The members reported, as the result of improved business, an increase of about 33,000 operatives in the past three years, 15,000 being added in the past year, which indicates a healthy situation in view of the introduction of new equipment.

Warm satisfaction was expressed as to labor conditions during the year in the annual report of Harold C. Smith, Illinois Tool Works, Chicago, president of the association, and the work of the association was declared to have minimized labor disturbances.

"In 1927 there was not a single strike in any of our member plants, and there have been only nine over a period of six years," the report stated. "During the year our membership of nearly 1100 has experienced a strike in only one locality. The metal trades have been singularly blessed with freedom in labor management, and the freedom we have enjoyed from outside domination is admirably attested by the volume and price of our products and by the high-wage levels, steady work and high standards of working conditions enjoyed by our employes."

Member plants responding to the business survey as of April 1 give most encouraging reports as to their general conditions. The April 1 reports showed 75 per cent reporting business good; 89 per cent, business as good as or better than six months abo; 83 per cent, business outlook good; 59 per cent, a scarcity of skilled labor; and 69 per cent, training programs for workmen. Reports from a similar number of members as of Jan. 1, this year, indicate a scarcity of skilled labor in 63 per cent of those metalworking plants.

Self Government of Industry Is Strong Force

THE growing ability of business and industry to govern itself comprises the outstanding achievement of the age, according to the view of Michael Montague, New York attorney, speaking on the contribution of law to industrial co-operation and efficiency, at the Wednesday session. He declared that the federal trade commission floundered for 10 years before finding a field of real usefulness in informal conferences with industrial groups for establishment of codes of ethics. He pointed out that about 50 codes of ethics have been authorized for industrial groups within the last two or three months in these informal conferences and that 12 more are pending. "These achievements of the federal trade commission should outlive the follies of the first ten years of the trade commission's existence," Mr. Montague said.

He pointed out that the exchange of legitimate statistical information, as authorized in a Supreme Court decision of several years ago, has helped to keep production in balance, the production curve on a more even line, avoiding dips and slumps, and has removed blind guesswork. The progress of industry in self government has been a tremendous energizing force, he said.

Progress in aviation was reviewed by Major C. H. Biddlecomb, of the Wright Aeronautical Corp., of Paterson, N. J., who declared that the airmail is the backbone of development in the airplane industry, and that service comprises a most fruitful field of research in aviation. Pointing out that airmail contracts have increased tenfold in the past two years, Major Biddlecomb stated that in the first quarter this year capital investment in the aviation industry amounted to $93,000,000. He urged industry to make use of the airmail service, declaring that in this way important help to aviation can be contributed.

"Progress in Employe Relationships" was discussed bq Dr. Harry Myers, director of personnel, Frigidaire Corp., Dayton, O., who declared that employe relationships, still a matter of experiment, should start in the employment office. He urged executives to visit employment offices, where insight into principles can be obtained that should aid in dealing with the 75 per cent of employes who are unskilled, as well as the 25 per cent comprising skilled labor. One of the chief problems facing the employment office, Dr. Myers said, is to obtain men who really want to work and who have had the right mental attitude toward work. He demonstrated how his department has analyzed methods of work and has required the wage earners of his company to memorize six rules of work, which include, "be clean and orderly; follow instructions well; work well from whistle to whistle; work every day; and work well with others." The importance of instilling the right mental attitude toward work and a real desire for work, because of inherent interest in it, is vital, according to Dr. Myers.

He predicted that some day employers will take as much interest in their employes as in their customers.

A paper prepared by Sterling Morton, president of the Teletype Corp., Chicago, on "Progress in Employe Training," was read and discussed. It was pointed out that the Chicago branch of the National Metal Trades association has been faced with a critical shortage of skilled mechanics and that its present program of employe

(*Concluded on Page* 1227)

Management Must Solve Industry's Problems

IN MY opinion there never can be a permanent solution of our industrial relations problems, because their aspects change as business develops. They can, however, be met and solved as we go along, just the same as other problems in industry must be met and solved. In approaching these problems we must bear in mind the part which public opinion plays and the necessity for presenting our views to the public. Industry is constantly being confronted by legislative proposals, some of which seek to place union labor above the law, and others to place upon industry the burden of paying for certain social reforms of a very doubtful nature. The public must be educated to realize that the proper way to continue our rising standard of living is not by doles to the unemployed, nor by state pensions to the aged, nor by other similar proposals, but by the formulation of sound principles of industrial relations. Management has the opportunity to meet these problems in a constructive way within the industry."—HAROLD C. SMITH, *President, National Metal Trades association.*

Welding Society Discusses New Fields and Uses for Processes

A SYMPOSIUM on welding education was an outstanding feature of the three-day annual convention of the American Welding society held at the Engineering Societies building, New York, April 24-26. Presentation of the Miller medal was made for the first time. F. T. Llewellyn, research engineer, United States Steel Corp., New York, was re-elected president and other officers were elected for the ensuing year. The annual dinner was held Thursday night, and on Friday the annual meeting of the American bureau of welding followed the technical session of the society.

Welding Important in Aircraft Construction

THE change in aircraft design from the wooden structures of some years ago to the high-strength alloy frames of today has opened a new and important field for the welding engineer, according to Richard M. Mock, aeronautical engineer, Bellanca Aircraft Corp., Newcastle, Del., who presented an illustrated paper on welding in aircraft construction. So rapid have been the changes in aircraft design that standardization is almost impossible, said the speaker, and for such new and unstandardized construction welding offers the only practical solution. The development of forgings and castings of special design nearly always follows original welded construction, he said.

Chrome molybdenum alloys have been found especially suitable for aircraft construction. This alloy has the peculiar property of air hardening or normalizing as it cools after welding, and as a result the tensile strength of chrome molybdenum parts approximates 95,000 pounds a square inch, whereas a value of 55,000 pounds per square inch is used in design work with carbon steel. For the chrome molybdenum welding, Mr. Mock said his company had found Swedish iron welding rods satisfactory. He said they use oxyacetylene torches exclusively, and that welding of nickel steel parts is discouraging because of the difficulties. They also discourage welding of duralumin as it loses strength in welding which cannot be regained by heat treating.

He told of the importance of heat treating in development of high strength members for airplanes. He said that heat treating furnaces had been developed to take spars 25 feet long, and that undoubtedly longer ones would be built as required. He cautioned against storing carbon steel near chrome molybdenum steel supplies because of the danger of substituting one for the other with disastrous results. The illustration in connection with Mr. Mock's paper showed the profuse use of tubing in airplane construction. This tubing is nearly always of chrome molybdenum steel and it is frequently oval in section, but sometimes square and many times circular. The tubing is joined by welding.

Main line tracks of standard steam railroads may be welded in long straight sections without encountering any difficulties due to expansion and contraction. This was the startling message brought back to this country from Germany by J. H. Deppeler, Metal & Thermit Corp., Jersey City, N. J., who presented a paper Thursday on welding of rail joints. Germany started work on welding main line joints in 1924, he said. At first they used elaborate expansion joints every three or four hundred feet, but examination of these joints during changes of temperature showed that movement of the rails was negligible, and they are now using longer and longer straight lengths without expansion provision. The welded joint has been used extensively in tunnel work where changes in temperature are small. It is also being used on steel bridges where the rail would be expected to expand in conformity with the steel girders. The use of welded joints has been found to effectively eliminate the bugbear of rail maintenance, creepage.

In the discussion following Mr. Deppler's paper F. T. Llewellyn, United States Steel Corp., New York, pointed out that the success with the use of welded joints clearly pointed to the rolling of longer and longer sections on the part of the steel mills. Others to discuss this paper included J. C. Lincoln, president, Lincoln Electric Co., Cleveland; Henry M. Hobart, consulting engineer, General Electric Co., Schenectady; and James W. Owens, director of welding, Newport News Shipbuilding & Dry Dock Co., Newport News, Va. In the discussion it was brought out that the average axle load in Germany is 18 tons compared with 40 tons for the average in this country. The carbon content in European rails averages about 0.40 against an average of 0.80 for the carbon in American rails. The type of weld used for steam line track is a combination of thermit pressure weld and fussion thermit weld. By means of heavy clamps the rail heads are brought close together under pressure

Welding Society's New Officers

President

F. T. Llewellyn, research engineer, United States Steel Corp., New York

Senior Vice President

A. E. Gaynor, J. A. Roebling's Sons Co., New York

Vice President, Southern Division

George Bird, president, Bird-Potts Co. Inc., Atlanta, Ga.

Vice President, Pacific Coast Division

John S. Beall, president, Beall Pipe & Tank Corp., Portland, Oreg.

Directors

C. A. Adams, professor of engineering, Harvard Engineering School, Cambridge, Mass.

H. M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y.

A. G. Oehler, associate editor, Simmons-Boardman Publishing Co., New York.

J. W. Owens, director of welding, Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

during welding. The lower parts of the rails at the joint are undercut and are welded in the usual way by thermit fusion.

The design of joints for welded steel structures was discussed in much detail in a paper by A. Vogel, General Electric Co., Schenectady, N. Y. This paper was very well received and was characterized by those who discussed it as being one of the most comprehensive reports on the subject to be presented before the society. G. H. Danforth, contracting engineer, Jones & Laughlin Steel Corp., Pittsburgh, in discussing the paper said he felt designers should try to get away from the use of bolts for assembling. This, he said, was a habit carried over from the riveted construction, and he described work under his direction where practically no bolts had been used. Instead he used clamps, and in many cases made partial assembly of parts by welding on the ground, and then raised these group assemblies into place with a crane. A. M. Candy, arc welding engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, advised the use of short welds wherever possible, saying that two short welds were better than one long weld. He said there was no such thing as a standard welded structure detail, and he urged greater co-operation between welding engineers and structural steel designers. Frank N. Speller, director metallurgy and research, National Tube Co., Pittsburgh, said there was a great lack of information as to the kind of material best suited for welding structural members. He said as far as he knew no work had been done except with the standard specification shapes. On this point Mr. Owens said that his experience in ship construction led him to believe that a low carbon content was desirable for welding. He said he preferred carbon below 0.20 for welding in contrast to the 0.250 common for general structural steel. By having the carbon low especially in places where joints come close together overheating of the base metal may be avoided.

New Field Is Suggested

A new field for the welding engineer was suggested by a paper on welding in the heating and ventilating industry by Prof. S. E. Dibble, Carnegie Institute of Technology, Pittsburgh. In this he described welded joints which gave far less resistance to flow than the usual threaded fittings. He described courses for instruction of welders with particular reference to the heating and ventilating industry, and strongly urged the introduction of welding into the plumber's art.

Miller Medal Awarded for 1927 and 1928

THE SAMUEL WYLIE MILLER medal was established in 1927 *by Mr. Miller, a past president of the American Welding society. Due to certain conditions of the award no presentation was made in* 1927, *but this year the board of trustees with Mr. Miller's approval awarded the medal for both* 1927 *and* 1928. *The first award of the medal, which is for the year* 1927, *was to Comfort Avery Adams, Lawrence professor at Harvard university, and recipient of many engineering honors. He has been president of the American Institute of Electrical Engineers, chairman of the John Fritz medal board, chairman of the Edison medal board, chairman of the general engineering committee of the council of national defense, chairman of the welding committee of the emergency fleet corporation, one of the organizers and first president of the American Welding society. The* 1928 *medal was awarded to James Harvey Edwards, chief engineer, American Bridge Co., New York, past director, American Society of Civil Engineers, and trustee of Cornell university.*

While individual joints have been tested for relative resistance to flow, there is need, according to Prof. Dibble, for further information covering the whole of a steam heating system. He suggested erecting two complete heating systems for test purposes, one to be equipped with standard fittings and piping, and the other to be welded throughout. Mr. Speller in discussing this paper pointed out the weakening effect of threads in the standard fittings, and said that corrosion was far more apt to affect a threaded joint than a welded joint. Mr. Owens pointed out that couplings could be made with the bolt circle much smaller by welded construction than by the present threaded design. Others discussing Mr. Vogel's paper pointed to the greatly simplified design of pipe covering where welded joints are used.

The building code committee has completed its code and this is now in the printer's hands, according to F. T. Llewellyn who outlined the work of the society in his presidential talk. He said that the society was increasingly becoming an authority in its field, that it was in a healthy condition and that activity of the various committees would continue through the coming year. The pressure vessel committee plans an important session at the meeting next fall. A paper is being prepared by the society, he said, in answer to an invitation to be represented at the world's conference of engineers at Tokio next fall.

Mr. Owens, speaking later for the nomenclature committee, said that a printed report would soon be in the hands of members, and urged all to adopt the new terms in their literature. The symposium on industrial welding schools was well attended and provoked enthusiastic discussion. Papers were presented at this symposium by C. E. Conway, educational director, Bedford branch, Young Men's Christian association, Brooklyn; L. S. Thurston, General Electric Co., Schenectady, N. Y.; F. E. Sellman, consulting engineer, Servel Inc., Evansville, Ind.; F. E. Rogers, publicity manager, Air Reduction Sales Co., New York, and others. Nearly all speakers agreed that more intensive training should be given; that there should not be more than 12 students per instructor and the supervisor should be constantly with his class. Each student should have a torch of standard make for his use throughout the entire course. Mr. Conway said that they found they had to compromise between a thorough course which might discourage the student and a course too short for practical use. He said they now were giving 14 lessons of three hours each, and that during the past year they had 408 students. He spoke of advertising to secure students, and emphasized the growing demand for good welders in the aviation, plumbing and heating industries.

Welding of Pressure Vessels

Unusually successful practice in welding large high pressure cracking tanks for the oil industry was described by T. McLean Jasper, A. O. Smith Corp., Milwaukee. He told of securing 100 per cent strength and ductility in the welded metal, and said the success was due to scientific study and accurate process control. His paper aroused much interested discussion. Mr. Owens told of the importance of the X-ray in developing welding process and technique. Mr. Llewellyn spoke of the need of confidence in welding on the part of pressure vessel users. He said confidence was, in fact, the keynote of the efforts of the society in this direction. In answer to a question as to cost, Mr. Jasper said that he felt it would not cost any more to deposit clean metal in a weld than to

deposit various undesirable impurities.

At the annual meeting of the American bureau of welding which is the research department of the society the present officers of the bureau were re-elected for another year. Wilber B. Miller, metallurgist, Union Carbide & Research laboratories, Long Island City, N. Y., was elected to the board of directors to fill the place left vacant by the death of S. W. Miller, consulting engineer, Union Carbide & Research Laboratories. James H. Edwards, chairman of the structural steel welding committee, described in considerable detail the encouraging work of that committee during the past year. The co-operation of 40 fabricating shops has been secured and tests are now being made at 11 of these. Twenty laboratories in colleges and institutions throughout the country have also co-operated. F. M. Farmer, chief engineer, Electrical Testing laboratories, New York, told of the work of the committee on tests, and said there was a need for devising new tests to be used on welded work, as the old standard tests were often unsuitable. Henry M. Hobart, consulting engineer, General Electric Co., Schenectady, N. Y., told of the co-operation of many leading universities in the matter of fundamental welding research. A conference of representatives from the universities was held during the year, and a second conference has been scheduled for next September in Cleveland. Nearly a dozen universities are now working on problems as outlined by the committee. Some of these are stresses, physics of the metallic art, X-ray and the effect of welds on parent metal. He told of a symposium on welding which is to be held next October at the Massachusetts Institute of Technology, Cambridge, Mass.

The boiler code committee reported encouragement. The state of California has taken an initial step in increasing the allowable stress in welded boilers, and it is expected that other endorsements of such increased stress will develop within the next few months.

Self Government Strong Force in Industry

(*Concluded from Page* 1224)

training is relieving that situation, the number of available skilled mechanics having been as low as 7000 in the Chicago district. The criticism that employes thus trained eventually are taken over by other firms, which then reap the benefits of the training, was described as a superfical objection. It was pointed out that the pool must be enlarged and that thus all industries in the community must benefit from employe training. Training of specialists is not necessary, it was pointed out, and the communist theory of "all for one and one for all" must be regarded as a principle applying to the advantage of employe training.

Thorough Training Necessary

The opinion was voiced that all employe training programs must be thorough, that apprentice shop schedules must be adhered to and not prolonged beyond contractual agreements, and that apprentice programs should be in co-operation with continuation schools. While admittedly apprentices are lured away by higher wages for specialists, it was pointed out that losses in some firms have been less than 5 per cent a year, and that the attractions of white collar jobs are not a serious detriment to obtaining apprentices.

The Thursday session was opened with an address on the question of how long prosperity should last, by Dr. T. N. Carver, department of economics, Harvard university. He found no evidences of inflation, and sees no possibility of a general slump in commodity prices or cancellation of orders, even if a collapse should develop on the stock market. Recent events have demonstrated, he maintained, that the country is not living on the proceeds of war profits. It is possible to pay high wages, even under conditions of the last few months, in this country as long as labor can produce an output per man years. He pointed out that prosperity depends upon the economy of man power and that the country that wastes its man power relatively cannot have prosperity.

Otto P. Geier, vice president, Cincinnati Milling Machine Co., Cincinnati, O., discussed progress in management and pointed out the steps being taken in industry to conserve the health, physique and morale of workmen. He emphasized that it is not necessary to coddle employes, but pointed out the great savings in time lost to industry where plant physicians can be in close contact with employes. The discussion cited possibilities of group efforts to bring about medical and dispensary treatment for small plants.

Elisha Lee, vice president, Pennsylvania railroad, in pointing out progress in transportation, declared no danger exists of railroad service receding to that of former years and said that railroad men never were more eager to provide and continue good service than now. The plans for future development of transportation, he said, are to keep transportation ideas in the forefront of industrial progress. He cited the comparative development of railroads, aviation and motor transportation, adding that the railroad will continue as the backbone of the transportation field, but that eventually the motor bus must be operated as supplementary railroad lines, thus speeding through train service.

Whiting Williams, Cleveland, counsellor on industrial relations, discussed industry under Mussolini, soviet Russia and Hoover. "Government in Russia represents despotism of the masses, that under Mussolini despotism of the individual, as compared with the democracy of the United States," said Mr. Williams. "The aims of these three ideas in government essentially are the same—economic and social equality. In Russia there is a marked distrust of business and the business man is regarded as a thief. There is a lack of equitable adjustment between the peasants and the industrial employe. We may see some fundamental changes in Russia within the next few years, as the present system seems incapable of getting peasants and industrial workers together. Russia, of course, has colossal buying power and thus may be of value to other countries later."

Russian Propaganda Dangerous

Mr. Williams said no government is justified in recognizing Russia until it does away with the propaganda against other political governments. Italian industry, he pointed out, has some fears of communism and there is a disturbing sense of inability, due to possible eventualities if Mussolini should die.

Wheeler McMillen, editor, *Farm and Fireside*, reviewed progress in agriculture, and declared that what the farms need as government help is a continuation of the policy of utilizing properly the marginal lands and of condemning unwise policies of colonization, in addition to further research to develop uses of farm products in chemical and industrial fields. For every dollar invested by the department of agriculture in the past for research, 500 has been added to the national income, he asserted.

Capt. W. H. Soderholm, of the Army Ordnance association, presented at a luncheon motion pictures of the latest developments in army ordnance manufacture and its testing at the Aberdeen proving grounds, Aberdeen, Md.

First Steel Skyscraper Is Now Being Wrecked

After standing for 42 years, the world's first steel-frame skyscraper, the northeast corner of LaSalle and Madison streets, Chicago, is being torn down to make way for a 49-story building on the same site. The 14-story Tacoma building was condemned that the University of Chicago might erect an $8,000,000 structure of polished granite and stone to be known as the LaSalle Street building. At the time of the Columbian exposition in 1893, the Tacoma building was a showplace of the city, visitors being told that it was the prototype of a new architecture.

In that structure for the first time the weight of the walls was supported upon the metal frame. Holabird & Roche were the architects and E. A. Renwick of that company was superintendent of construction. The building used cast-iron columns and cast-iron spandrel lintels and had wrought-iron beams and girders. Floor arches were of the hollow-tile type.

In 1889, or about two years later, steel was introduced into building construction for the first time in history. Later open-hearth steel was adopted in place of bessemer steel. The material was improved chemically each time, making possible structural members capable of supporting more weight and of resisting corrosion more successfully. According to the American Institute of Steel Construction, the frame of the Tacoma building was found good upon demolition.

Empire Steel Expands

Empire Steel Corp., Mansfield, O., is to spend $100,000 on improvements at its Falcon plant at Niles, O., to increase production of full finished sheets. The new equipment will include a sheet pack heating furnace and a normalizing furnace.

Exports of Industrial Machinery Rise

Exports of industrial machinery from the United States took a sharp upward turn in March, and reached the high total of $25,050,782. This represents a gain of $5,489,000 over the February and of $7,747,000 over March, 1928, and exceeds the monthly average for any year since 1920, states the industrial working division, department of commerce. Export figures for the three months period ended March, 1929, show a gain of $17,218,000 over the corresponding three months of 1928 and further confirm the steady upward trend in American machinery exports since the slump of 1922.

The sharp rise in industrial machinery exports during March, compared with March, 1928, is chiefly accounted for by greatly increased shipments of internal combustion engines, and well and refinery, pumping, and metal working machinery, although gains were general all along the line, especially for the unclassified items. Of the principal classifications, steam engines alone showed a decline under March, 1928, but the amount involved was insignificant.

James A. Farrell Is Named First Gary Memorial Medal Recipient

JAMES A. FARRELL, president, United States Steel Corp., has received the first award of the Gary memorial medal. The award was made at the regular monthly meeting of directors of the American Iron and Steel institute, held in New York, April 26. According to the announcement, the award was made to Mr. Farrell for distinguished achievement in the iron and steel industry. Presentation of the medal will be made at the banquet at the spring meeting of the institute at the Commodore hotel, New York, May 24.

The committee on award, on whose recommendation the board of directors thus acted, comprises Charles M. Schwab, James A. Campbell, John A. Topping, Samuel Mather and Willis L. King.

The Gary memorial medal is of gold. Decision to establish the medal was made at the institute's thirty-second general meeting, Oct. 28, 1927, to honor Elbert H. Gary, founder and first president of the institute, and to perpetuate the memory of his achievements in the iron and steel industry. The terms governing its award are broad, providing simply that it shall be awarded for "outstanding achievement in the iron and steel industry." There is no restriction on account of nationality or sex. Accompanying the medal will go an engraved certificate reciting the origin of the medal and the specific achievement for which the award was made, this certificate to be signed by the president and secretary of the American Iron and Steel institute.

JAMES A. FARRELL

The Gary memorial medal is to be awarded annually, and a new board of award will be appointed each year from the directorate of the American Iron and Steel institute.

McKee To Rebuild Stack

Arthur G. McKee & Co., engineers and contractors, Cleveland, have been awarded contract by Wheeling Steel Corp., Wheeling, W. Va., for the design and construction in connection with the complete rebuilding and modernization of its No. 1 blast furnace plant at Steubenville, O. This furnace plant will be designed to meet all the requirements necessary for the increased capacities and efficiencies demanded by present day practice.

Negotiates for License

Republic Iron & Steel Co., Youngstown, O., is understood to be negotiating with the American Rolling Mill Co., Middletown, O., for a license to roll sheets by the continuous process patented by the American company. A continuous mill is operated by the Trumbull division of the Republic company.

Producers in France, England and Sweden are reported negotiating for licenses.

Bar Iron Wage Stands

The bi-monthly examination of sales sheets of bar iron mills by the Western Bar Iron association and the Amalgamated Association of Iron, Steel

and Tin Workers has resulted in the 2.00c price being found unchanged in March and April, resulting in wages continuing without change for May and June. Under the sliding scale the puddling wage on a 2-cent card is $11.80 per ton. Following is a comparison:

	1929	1928	1927	1926
Jan.-Feb.	2.00c	1.85c	1.95c	2.00c
March-April	2.00c	1.85c	1.95c	2.00c
May-June	.....	1.90c	1.95c	2.00c
Sept.-Oct.	.....	1.95c	1.90c	2.00c
Nov.-Dec.	.....	2.00c	1.85c	2.00c
Yearly average	.....	1.908c	1.925c	2.00c
July-Aug.	.....	1.90c	1.95c	2.00c

Bethlehem Earnings Four Times Year Ago

New York, April 30.—First quarter earnings of the Bethlehem Steel Corp. were more than four times those of the opening quarter of 1928 and a peacetime record. At the recent quarterly meeting E. G. Grace, president, reported earnings after all charges and dividends of $4.05 per share, compared with $2.58 in the final quarter of 1928 and 94 cents in the first quarter of 1928.

Orders on hand March 31 totaled $62,702,683, compared with $59,040,202 Dec. 31 and $61,393,488 a year ago. Current operations approximate 102 per cent of the 8,000,000-ton rated capacity. Only a moderate seasonal letup is expected, Mr. Grace said.

Extensions and betterments are to be financed by issuance of 600,000 shares of common to be offered stockholders at $85 on the basis of one new for every three old shares owned. Expansion is to be along broad lines at present properties, Mr. Grace said. A financial comparison follows:

	First quarter 1929	Fourth quarter 1928	First quarter 1928
Income	$15,245,471	$12,686,397	$9,574,948
Less Int.	2,780,575	2,787,423	2,838,145
Balance	12,464,896	9,898,974	6,736,803
Depre., deple., and obs.	3,419,306	3,499,626	3,352,085
Net income	9,045,590	6,399,348	3,384,718
Dividends:			
Preferred	1,750,000	1,750,000	1,697,500
Common	1,800,000	1,800,000	.....
Total	3,550,000	3,550,000	1,697,500
Surplus	5,495,590	2,849,348	1,687,218

Repairing Blast Furnace

Wickwire Spencer Steel Co. Inc. is preparing to repair its Harriet Y blast furnace at Buffalo. Contracts for reinforcing the mantle and furnace shell, rebuilding ore bins, installing a new water trough and making miscellaneous repairs to the walkways on the furnace and washer have been awarded to R. R. Hetz, engineering contractor, 1281 Arlington road, Cleveland. H. A. Brassert & Co., Chicago, are engineering the reconstruction. It is hoped to have the furnace in operation by July 1.

Superior Steel Net Up

Pittsburgh, April 30.—Superior Steel Corp. reports for the first quarter net earnings of $108,352, equal to $1.08 per share on 100,000 shares of common stock. This compares with a deficit of $63,117 in the first quarter of last year. Net sales for the first three months totaled $2,173,668, against $1,775,626 in the preceding quarter and $1,447,180 a year ago. Current assets of $2,371,168 compare with current liabilities of $415,103. Improved earnings are looked for by officials during second quarter.

Much Wabana Ore Sold

Toronto, Ont., April 30.—Sir Newton Moore, an English director of the British Empire Steel Corp., after an inspection of the corporation's iron ore properties at Belle Isle, Newfoundland, estimates that this year the production of Wabana iron ore will be 1,500,000 tons, of which 700,000 tons has been sold for shipment overseas. Last year's sale of ore amounted to 960,000 tons, most of which went to Rotterdam and South Wales.

Rolling Mill Equipment Demand Heavy

Pittsburgh, April 30.—United Engineering & Foundry Co. has on hand orders aggregating approximately $4,250,000 and the outlook for future business is excellent, George T. Ladd, president, advised stockholders at the recent annual meeting. Retiring members of the board of directors were re-elected.

"The amount of business moving in rolling mill machinery in 1928 was somewhat limited," Mr. Ladd said. "In November inquiries picked up and pending at present we have orders aggregating $4,250,000. Operations are gradually gaining and we confidently expect all shops to be working full time within the next 60 days.

"Since the first of the year we have consolidated the McGill machine shop with the Frank-Kneeland machine shop, and the foundry at Frank-Kneeland plant with the foundry at our Youngstown plant, these two moves being to reduce overhead and increase output at the respective plants. During 1928 we spent $257,603 for new equipment, and in all probability an increased amount will have to be spent for some little time in connection with our machine tool equipment."

Alliance Is Formed by Cleveland Cliffs Iron Co. and Eaton Group

CLEVELAND, April 30.—Participation of Cyrus S. Eaton and associates, Cleveland, in the Cleveland Cliffs Iron Co., effected at a recent conference at the winter residence of William G. Mather in Pasadena, Calif., is believed to be another preparatory step looking forward to a merger of several important independent steel producers.

Founded in 1850 as the Cleveland Iron Mining Co., the Cleveland Cliffs company is an important factor in the iron ore, pig iron and Great Lakes transportation business. Its large iron ore properties in the upper lake region and its fleet of 24 coal and ore freighters are believed to be an attractive groundwork for any independent steel merger.

Commenting upon the entrance of the Eaton interest into the Cleveland Cliffs company, Mr. Mather has said:

"I regard the new association of great importance to both interests inasmuch as the Cleveland Cliffs Iron Co. with its vast reserves of iron ore, in addition to its operating mines, would secure the co-operation of the man who has a very large interest in and influence with some of the leading steel companies in the Middle West.

"Mr. Eaton would by his participation in the affairs of the Cleveland Cliffs Iron Co. assure to certain steel companies an interest in an almost unique supply of raw material which the steel companies require."

Steel interests in which the Eaton group is active include the Republic Iron & Steel Co., Inland Steel Co. and Central Alloy Steel Corp. Recently it acquired an interest in the Bourne-Fuller Co., Cleveland. The Mather and allied interests in the Cleveland Cliffs company are close to the Youngstown Sheet & Tube Co. Bethlehem Steel Co., Otis Steel Co. and Corrigan, McKinney Steel Co.

Industrial Men in the Day's News

Prof. Henry Louis, New President, British Iron and Steel Institute

From an engraving by E. A. Black & Co., London, England

HE IS the first president the institute has had who qualifies both as a metallurgical and as a mining engineer.

FROM his pen have come numerous contributions on metals, minerals and mining.

HIS initial service was under the late Sir William Siemens at Towcester works, where the rotator process was in use for making iron direct from ore. He has been active as an engineer in South America, West and South Africa, the Far East and Nova Scotia.

PROF. HENRY LOUIS, who will be inducted as president of the British Iron and Steel institute at its annual general meeting on May 2 and 3, will be the first president of the institute to possess the qualifications of metallurgical engineer and mining engineer. He is professor emeritus in mining at the Armstrong college of the University of Durham.

Professor Louis was born in London in 1855, his father having been a lace merchant in that city. He received his early education at the City of London school, and subsequently, having gained an exhibition scholarship of the science and art department, he entered the Royal school of mines, where he gained further scholarships and the De La Beche medal. He took his associateship in 1876. He first served under the late Sir William Siemens, at the Towcester works, where the rotator process for the reduction of iron direct from its ores was in operation.

Three years later, and just after Messrs. Thomas and Gilchrist had read their historical paper before the Iron and Steel institute on "The Elimination of Phosphorus," Professor Louis again was engaged by Sir William Siemens in experiments at Landore on attempts to adapt the basic process to the open-hearth method of steelmaking. One of the principal difficulties was to obtain suitable refractories, and Professor Louis had just succeeded in making a reliable dolomite brick when the funds available for the investigation ran out and his engagement terminated.

Professor Louis then began an active career abroad. He went in for iron and cokemaking, coal and iron mining in Nova Scotia, gold mining in South America and West Africa, gold and diamond mining in the Transvaal and at Kimberley, gold, tin and gem mining in the Far East.

As a result of his complete experience, Professor Louis published a number of textbooks on varied subjects such as gold milling, the metallurgy of tin and of platinum, shaft sinking, the dressing of minerals, traverse and tachometer tables, mineral valuation and the preparation of coal for the market. Other books published in collaboration with others are: "Ore Deposits," by Phillips and Louis; "Textbook of Metallurgy," by Louis and Schnabel. He also made many contributions to numerous scientific societies and congresses.

In 1896 Professor Louis was appointed professor of mining at the Armstrong college, and later on William Cochrane lecturer on metallurgy. He devoted considerable time as consultant to numerous mining and metallurgical concerns, on government commissions and on many committees. He has been for several years a member of the council of the Iron and Steel institute. He is a past president of the Society of Chemical Industry, vice president of the Institution of Mining and Metallurgical Engineers, and president of the Institution of Mining Engineers. He also is a member of the Institution of Civil Engineers and chairman of the Newcastle-on-Tyne and District Association of that institution, a Fellow of the Institute of Chemistry and of the Geological society, and an honorary member of the Societe de Chimie Industrielle and other societies. He also is the secretary of the North of England Institute of Mining and Mechanical Engineers.

Men of the Industry

JOHN H. NELSON has been appointed manager of the Worcester, Mass., division, Wyman-Gordon Co. Mr. Nelson, who succeeds the late G. Frank Hathaway, has been chief metallurgist for the company for 11 years, and is a graduate of the University of Illinois. Previous to his connection with the Wyman-Gordon Co. he was with the bureau of standards, Washington. He has also been a member of the faculty at the Worcester Polytechnic institute and Case School of Applied Science, Cleveland. Mr. Nelson is a member of the American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, Society of Automotive Engineers, American Society for Steel Treating and the British Iron and Steel institute.

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Charles M. Schwab, chairman of the Bethlehem Steel Corp., was elected president of the Pennsylvania society recently for the twefth time.

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George T. P. Klix, formerly chief engineer of the C. R. Wilson Body Co., Detroit, recently was appointed body engineer for the Griswold Motor Body Co., Detroit.

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C. R. Crane, Mattison Machine Co., Rockford, Ill., was nominated as chairman of the Rockford chapter of the American Society for Steel Treating, to succeed R. M. Smith.

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Everett Drennen has been elected a director of the Colorado Fuel & Iron Co., Denver and Pueblo, Colo. He will serve also as vice president in charge of fuel operations.

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P. P. Barrett has been placed in charge of a new sales office recently opened by the Apollo Steel Co., Apollo, Pa., at Indianapolis. His headquarters are 846 Illinois building.

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Harris Creech, president of the Cleveland Trust Co., Cleveland, has been elected a director of the Youngstown Sheet & Tube Co., Youngstown, O., succeeding the late Harry Coulby.

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H. J. French, until recently senior metallurgist of the bureau of standards, United States department of commerce, Washington, has become associated with the development and research department of the International Nickel Co., 67 Wall street, New York, being located at its research laboratory, Bayonne, N. J.

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Quincy Bent, vice president of the Bethlehem Steel Corp. in charge of steel properties, has been elected a director of the corporation, succeeding the late John Griggs.

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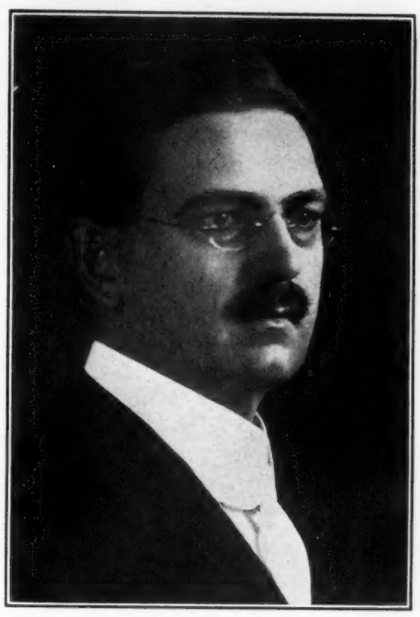
J. J. Jones has been elected vice president of the Tidewater Structural



JOHN H. NELSON

Materials Corp., 271 Madison avenue, New York, succeeding N. H. Buschman. Mr. Jones previously had been sales engineer for this company.

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Phil W. Sloan, for many years identified in executive capacities with the Timken Detroit Axle Co., Detroit, has been made sales engineer of the Slade Asbestos Corp., New York. His headquarters will be in Detroit.

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B. H. Gilpin, formerly quality manager of the H. H. Franklin Mfg. Co., Syracuse, N. Y., has been appointed service manager of the Hartford, Conn., plant of the Pratt & Whitney Aircraft Co.

* * *

Frank R. Williams is now associated with Gears & Forgings Inc., Cleveland, in the Buffalo territory. He has spent many years in the power transmission field and will devote considerable time to the speed reducer line of the company.

* * *

H. G. Batcheller, vice president, Ludlum Steel Co., Watervliet, N. Y., and president of the Krupp Nirosta Co. Inc., sailed on the Olympic, April 26 for Germany. He was accompanied by Harold O. Barker, a director of both companies.

* * *

C. Vernon Nass was made superintendent of the brass foundry for Fairbanks, Morse & Co., Beloit, Wis. Mr. Nass was chemist and metallurgist for the Ohio Brass Co., Mansfield, O., from 1923 to 1928 and for the Humphryes Mfg. Co., Mansfield, until his recent appointment.

* * *

Charles Strom, formerly with the Fisk Tire & Rubber Co., Akron, O., has become affilated with the export sales department of the Black & Decker Mfg. Co., Towson, Md., and after a brief period at the plant, will represent the company in foreign markets.

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Rodolfo Reyna and Nava y Fernando Barrera Bowring, engineers of the Monterrey Iron & Steel Co., have returned to the company's headquarters in Mexicq City, Mexico, after three years' study in iron and steel plants and foundries in Germany. They took courses at the Superior Technical school, Berlin.

* * *

M. G. Dodson, formerly in charge of divisional sales at the Youngstown, O., office of the Genfire Steel Co., has been transferred to Detroit to take charge of the company's recently established headquarters there at 439 Penobscot building.

A. A. Fraser, for two years manager of the Dallas, Tex., branch, has been transferred to San Francisco as manager there.

H. G. Coffman, for three years salesman in the Syracuse, N. Y., branch office has been transferred to Dallas to succeed Mr. Fraser.

* * *

George A. Marr, for 25 years secretary of the Lake Carriers' association, Cleveland, was elected second vice president of that organization at its annual meeting April 18 and in

honor of 25 years service was presented with a watch and chain. He now is second vice president, secretary and treasurer. J. S. Ashley, president, and L. C. Sabin, vice president, were re-elected.

In the election of directors, H. G. Dalton succeeds the late Harry Coulby, R. B. Wallace replaces A. T. Kinney, J. E. McAlpine, Buffalo, takes the place of J. B. Rogers, and George Kendrick, R. J. Paisley and J. G. Munson of Rogers City, Mich., were added.

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A. G. Bean, Elyria, O., was elected director of the Lake Erie Bolt & Nut Co., Cleveland, April 23, to succeed Chester C. Bolton.

* * *

C. D. R. Meier, formerly president of the Heine Boiler Co., St. Louis, was recently made junior partner of Jackson, Storer and Schwab Inc., St. Louis.

* * *

R. A. Becker, for three years with the credit department of Truscon Steel Co., Youngstown, O., has been transferred to the company's branch office at Newark, N. J., as branch credit manager, under C. D. Loveland, branch manager.

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A. R. Gelinas, 1434 St. Catherine street, Montreal, Can., has been appointed district representative of the American Hoist & Derrick Co., St. Paul. His territory comprises Ontario, Quebec, and the Maritime provinces of Canada.

* * *

Harvey Jordan has been made superintendent of Central furnaces of the American Steel & Wire Co., Cleveland. He succeeds John C. Hopkins, who, as noted in IRON TRADE REVIEW of April 25, was promoted to be general superintendent of blast furnaces and steelworks.

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William A. Armstrong, veteran roller in the Farrell, Pa., plant of the Carnegie Steel Co., having been employed there for 25 years, was appointed assistant superintendent in charge of the 48-inch universal plate mill. The plant has resumed operations after a 2-year shutdown. Mr. Armstrong succeeds the late Thomas Alters.

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Thomas Newhall and Arthur E. Newhold Jr., of Drexel & Co.; Nathan Hayward, president of the American Dredging Co.; and J. Willison Smith, president of the Real Estate-Land Title & Trust Co., all of Philadelphia, have been added to the board of directors of the Philadelphia & Reading Coal & Iron Co. and the company shortly will appoint an executive committee.

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William C. Hedgcock, recently appointed chief mechanical engineer of American Steel Foundries, Chicago, was employed in the mechanical department of the Louisville & Nashville railroad at Louisville, Ky., from 1905 to 1911, when he became chief draftsman of the Chicago, Indianapolis & Louisville railroad at Lafayette, Ind. In 1912 he entered the employ of American Steel Foundries in the engineering department at Granite City, Ill., later being transferred to the Hammond, Ind., works, and was made mechanical engineer of brake department at Chicago in 1915. Mr. Hedgcock served from 1917 to 1919 as lieutenant and captain in the engineering division of the army ordnance department. Returning to American Steel Foundries in 1919 as mechanical engineer of brake department, he later was promoted to assistant chief mechanical engineer, which position he held until his recent appointment as chief mechanical engineer.

WM. C. HEDGCOCK

G. G. Floyd has been made mechanical assistant to the president of the American Steel Foundries. He has been chief mechanical engineer at the Chicago office since 1912.

* * *

J. F. Hahn was elected vice president and treasurer of the National Enameling & Stamping Co., Milwaukee, in charge of finance.

Thomas W. Gulley, general sales manager, also has been elected a vice president, in charge of sales. Mr. Gulley started with the company at the Baltimore branch and was then transferred to the general offices in Milwaukee to take supervision of the sales department.

* * *

George R. White, formerly with the Stevens Co., Boston, engineer, has been appointed assistant to the president of the Superior Steel Corp., Pittsburgh.

Paul C. Jennings, formerly with Haskins & Sells, Pittsburgh, accountants, has been appointed treasurer of the Superior Steel Corp. to succeed C. D. Claney, formerly secretary-treasurer, who relinquishes his duties as treasurer and continues as secretary.

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Walter G. Hoffman has resigned as assistant superintendent of the works practice department of the Jones & Laughlin Steel Corp., Pittsburgh, to become chief engineer of Brooke L. Jarrett & Co., Oliver building, Pittsburgh. Mr. Hoffman has been identified with the South Side works of the Jones & Laughlin corporation for the past eight years. Prior he served as assistant master mechanic and combustion engineer at the Saucon plant of Bethlehem Steel Co., Bethlehem, Pa.

* * *

Robert A. Miller has been appointed purchasing agent of the United Dry Docks Inc., recently formed as a merger of the Staten Island Shipbuilding Co., James A. Sherwan & Sons Co. Inc., W. & A. Fletcher Co., the Morse Dry Dock & Repair Co., the New York Harbor Dry Dock Co. and Theodore A. Crane & Sons Co., all having ship building and ship repair yards in the New York harbor. Mr. Miller's headquarters are at the Morse yard at the foot of Fifty-sixth street, Brooklyn. Mr. Miller prior to the merger had been purchasing agent of the Staten Island Shipbuilding Co.

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John R. Freeman, Providence, R. I., past president of the American Society of Mechanical Engineers, international authority on hydraulic engineering, has been awarded an honorary fellowship by the Polytechnic Institute of Karlsruhe, Germany. Mr. Freeman is the author of the recent work "Hydraulic Laboratory Practice" and also holds a gold medal of the American Society of Mechanical Engineers for notable accomplishments in fire prevention engineering. The University of Pennsylvania in 1927 awarded him the honorary degree of doctor of science.

* * *

M. G. Gurevitch, vice chairman, Amtorg Trading Corp., 165 Broadway, New York, and representative of

the Soviet Supreme Economic council in this country, has sailed for Russia to be gone several months. He will report to the council on purchases made by Amtorg for various Soviet industrial organizations and on several agreements recently made with American companies for technical assistance in Soviet industries. A delegation from the Putilov Machine Works at Leningrad, headed by V. F. Grachev, manager of the plant, also left for the Soviet Union after spending several months in this country purchasing equipment for the tractor division of the plant.

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Barton R. Shover, consulting engineer, Pittsburgh, has moved his office from 424 Oliver building, that city, to 440-442 in the same building.

* * *

C. M. Carmichael, general manager of the Welland Steel Castings Ltd., has been elected president of the Welland, Ont., board of trade.

* * *

Joseph E. Gore, president of the Rochester Smelting & Refining Co., Rochester, N. Y., has been elected president of the Purchasing Agents association of that city.

* * *

John B. Klumpp, for five years vice president of the United Gas Improvement Co., Philadelphia, has resigned after 35 years of continuous service. He will become utility consultant. Mr. Klumpp is a past president of the American Gas association and a member of the association's board of directors.

* * *

Gen. J. W. Stewart and Col. Victor Spencer have been added to the board of directors of the Western Canada Structural Steel & Bridge Co. Ltd., Vancouver, B. C., recently formed to acquire the business of J. Coughlan & Son Ltd. These with Laird Gordon, president of Gordon & Belyea Ltd., who also is vice president of the Western Canada Structural company, constitute the board.

Wheeling Net Increases

Net profits of the Wheeling Steel Corp. for the first quarter amounted to $1,795,243, compared with $1,024,214 for the corresponding period of 1928. The surplus reported by the company as of March 31 was $14,165,009, against $11,040,063 one year before.

Formal opening of Curtis Hall Engineering laboratory of Drexel institute, Philadelphia, is announced for May 2 at 11:30 a.m.

Obituaries

EDWARD F. CARRY, 61, president of the Pullman Co., West Pullman, Ill., an official of Pullman Inc. and numerous other companies, died suddenly April 24 at his home in Chicago.

He was born in Ft. Wayne, Ind., the son of a foundryman, and started in 1888 as stenographer for the Wells & French Co., Chicago, railroad car builders. In 1899 he went with the American Car & Foundry Co., becoming first vice president in 1915.

Later he went to the Haskell & Barker Co., Michigan City, Ind., as its president. When that company was absorbed by the Pullman Co. in 1922, he was elected president of the Pullman Co.

He was interested as a director or in other capacities in the Continental Illinois Bank & Trust Co., the Electric Household Utilities Corp., Montgomery Ward & Co., the Pullman Trust & Savings bank, the Carmor Metal Products Co., the Atlas Portland Cement Co., the Chrobaltic Tool Co. and the Continental Illinois Co., all of Chicago, and the Guaranty Trust Co., New York.

During the World war, he was chairman of the shipbuilding adjustment board and director of operations of the United States shipping board. He was also trustee of the Emergency Fleet corporation and chairman of the port and harbors facilities commission under the Shipping board.

He was a member of many organizations, including the American Iron and Steel institute.

* * *

A. E. Hughes, statistician in charge of weighing for the Youngstown Sheet & Tube Co., Youngstown, O., died April 19 at Richmond, Ind.

* * *

Walter H. Neal, purchasing agent of the Peck, Stow & Wilcox Co., Southington, Conn., died April 15. He had been connected with the company for more than 50 years.

* * *

Ralph L. Channell, 51, eastern sales agent of Hiram Swank's Sons Inc., Johnstown, Pa., and of the Van Dyke Silica Brick Co., as well, for the past 22 years, died at Philadelphia, April 25.

* * *

Justus W. Sherrick, 65, president, American Punch & Shear Co., Indianapolis, died recently at Keokuk, Iowa. He was born in Ashland, O., but had lived in Indiana most of his life and had spent the last 15 years in Indianapolis.

* * *

H. W. Gray, 71, for more than 20 years purchasing agent at the McKeesport, Pa., plant of the National Tube Co., Pittsburgh, died at the company's office April 29. He had been identified with the company more than 40 years.

* * *

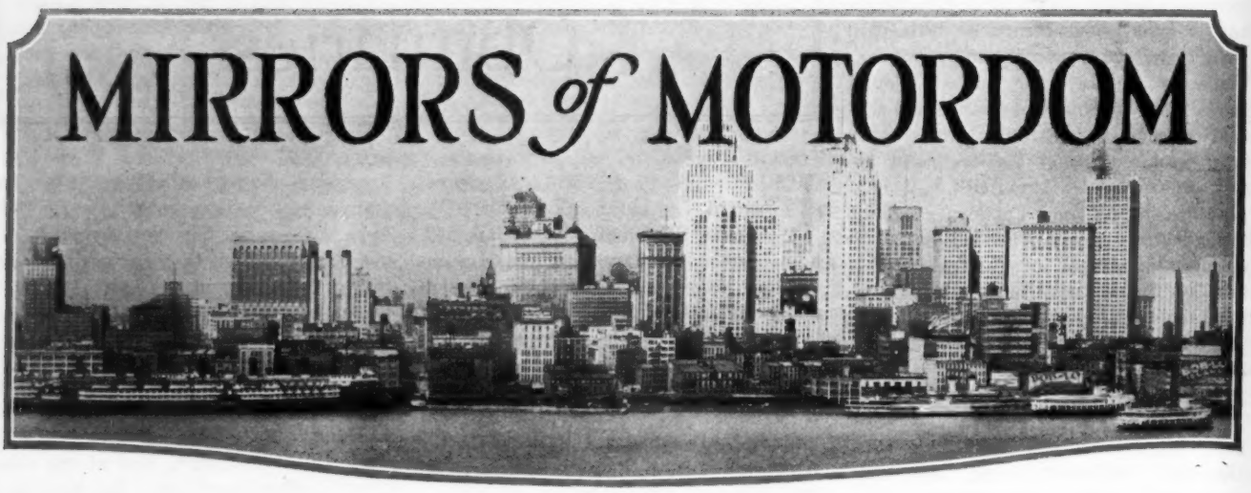
William Pelton Collins, 70, former president of the Collins Iron Works, Long Island City, N. Y., died April 21 at St. Albans, L. I. He entered the iron business conducted by his father, then known as William Collins & Co. Later the business was moved to Long Island.

* * *

James F. McCloskey, president and general manager of the Lincoln Machine Co., Pawtucket, R. I., widely known mechanical engineer and inventor, died at his home at Providence, R. I. April 28. During the war Mr. McCloskey reorganized the Remington Arms plant at Bridgeport, Conn. He previously had been connected with the Taft-Pierce Mfg. Co., Woonsocket, R. I., and the United Shoe Machinery Co., Beverly, Mass.

* * *

Louis I. Bregman, 59, president of Price Iron & Steel Co., Chicago, died April 28 at his home in that city following an illness of several months. Mr. Bregman was widely known in the iron and steel scrap business in the Middle West. A native of Cleveland, he headed the firm of L. I. Bregman & Co., buyers and sellers of iron and steel scrap in that city, for about 20 years. He established a company under the same name in Chicago in 1906, retaining the Cleveland company as a branch for a time. In 1910 the company in Chicago was reorganized under the name of the Price Iron & Steel Co. Mr. Bregman had resided in Chicago since the establishment of his company. One of his sons, Walter I. Bregman, is vice president of the Price Iron & Steel Co. Mr. Bregman had been widely interested in the scrap dealers' association work.



Steel Requirements Drop 10 to 30 Per Cent

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Water Shipments Are Increasingly Important Factor

Detroit, April 30

ADMITTEDLY lower than in March, steel specifications emanating from this territory have taken no precipitate retreat. The recession is more of an orderly stepping down of tonnage from the recent record high peaks. While in some cases in the lighter rolled steel category, specifications are as much as 30 per cent less than in March, this is partially due to over-specifying for March to be assured of having enough material, and in May something of a rebound is due. Because the releases now being received are for steel to be worked up in the June-July period, steel companies thus early are feeling the effect of the usual letdown by automobile companies in those months, which this year, it is believed, is destined to be of shorter duration than ever.

Judging from the specifications, now in hand or assured, the April-May period will be on a par with the February-March one insofar as automobile output is concerned. This is reflected in the production achievements, already recorded for March and about to be announced for April. In almost every case, makers realized their ambitions to stay at the March record level or slightly exceed it. While there was a temporary letdown in some directions two weeks ago, chiefly in Dodge, Hudson-Essex, Studebaker, Chrysler and possibly a few smaller units, practically all but one or two have staged comebacks and for May plan greater effort than ever. When the final figures for April car and truck output are declared, it possibly may exceed the March by a slight margin, the March total according to the National Automobile chamber of commerce being 625,354 cars and trucks, which included 584,733 units for the United States divided as 515,174 cars and 69,559 trucks. The following is an approximate comparison of the March-April lineup, insofar as obtainable at the moment:

	March	April
Auburn	2,400	2,500
Chandler	2,100	2,500
Chrysler		
DeSoto		
Plymouth	25,700	27,000
*Dodge	23,750	27,500
Durant	11,200	9,000
*Ford	181,894	176,000
Franklin	1,600	1,700
Gardner	700	700
General Motors Corp.		
Buick	15,206	15,000
Cadillac-La Salle	4,009	4,000
*Chevrolet	147,274	150,000
Oakland-Pontiac	36,460	40,000
Oldsmobile-Viking	13,000	15,000
Graham-Paige	9,610	11,000
Hudson-Essex	44,295	45,000
Hupmobile	4,316	5,500
Jordan	400	600
Lincoln	800	800
Marmon	3,604	3,500
Moon	450	600
Nash	15,384	16,000
Packard	4,780	4,600
Peerless	1,600	2,500
Pierce-Arrow	1,107	1,500
*Reo	4,611	6,500
Stearns-Knight	275	300
Studebaker	14,000	14,000
Stutz	550	750
*Willys-Overland	35,000	40,000
Total	606,075	624,050

*Cars and trucks.

The steel trade here is firmly of the belief that the summer and vacation slump will not cut in on the total for the year as much as usual. Plans are being laid on solid foundations by the two major manufacturers, General Motors and Ford, for quicker comebacks in the third quarter than have been staged in many years. Henry Ford recently stated: "We will do more in the next five years than in the past 20." Greater participation than ever in foreign markets is proposed.

* * *

FURTHER confirmation of the fact that May output of automobile companies is to be at least on a par with April, is gained from the scrap lists being offered for bids by them. For several days these have been coming before dealers for bids. In almost every case, scrap to be produced in May exceeds the April figures by 25 to 33 1/3 per cent. Whereas Chevrolet offered 155 miscellaneous carloads for April, it is tendering 206 for May. Dodge took bids on 1850 gross tons of short shoveling turnings for April; it is taking bids on 2300 gross tons for May. Its offerings of miscellaneous carloads for the two months are 34 and 27 respectively. Much of this scrap is going by water to Cleveland, Erie and Buffalo.

* * *

WATER-BORNE steel is to be a larger factor than ever in the Detroit market during the present navigation season, despite certain recognized objections. Bethlehem Steel, pioneer in this field in the way of shipping in steel by boat and taking out scrap on the return trip, plans a 4-day schedule, with two large boats

the LAGONDA and VENUS, and several smaller ones. The first of the larger boats docked here on Friday of last week. Because these ships are owned by an affiliated interest, freight rates are not published but the Nicholson Terminal & Dock Co., which recently built a new terminal, is quoting a 15-cent rate by water from Cleveland as against the all-rail rate of 23½ cents. Other shippers quote 17 cents, so that the saving is less than $2 per ton, which partially is eaten up by unloading and loading charges at this end, with switching charges when material has to be trans-shipped to other points by rail. Otis Steel, Bourne-Fuller, Pickands, Mather and others all are shipping in steel by water.

* * *

SIDELINES, such as its aviation motor department, its engineering division (which has been made to show a profit instead of being merely a necessary expense) etc., mean much to the Packard Motor Co. and its stockholders. Non-car profits in 1928, of $5,993,196 covered approximately half of the company's common dividend requirements for the whole year. Car profits amounted to $15,892,220. These figures compare with $3,018,000 and $6,112,000, respectively for 1927. While the average sales price per car has declined from $2695 in 1923 to $2007 in 1928, and the average manufacturing cost per car from $2542 to $1668, the average manufacturing profit per car has increased from $153 to $337 or 14 per cent of selling price.

* * *

SPEAKING of profits, on its sale of 523,119 cars to dealers in the first quarter this year, General Motors made a profit of $118.35 per car. On the basis of cars sold by dealers to users (448,176) this was $138.14, since total profits were $61,910,987 before deduction of preferred and debenture stock dividends of $2,351,770. After that deduction it left $59,559,217 net profit, equivalent to $1.37 per share on the common stock as against $1.54 a year ago, calculated on a comparable basis. For the first quarter 1928, the profit per car on sale of 492,234 cars to dealers was $141.13, while on their sales to users it was $164.22 per car, when the profit prior to dividends was $69,468,576.

* * *

RAPID progress will be made from this time forward on the Monroe, Mich., plant of Newton Steel Co. The railroad siding is almost complete. Filling material is arriving. For the first time in more than a quarter century a large ship negotiated the United States ship canal April 23-24 on its way to the pier, when the EMORY, a steel hull ship 150 x 35 x 9 feet, loaded with 350 yards of gravel arrived from Detroit, consigned to the steel company. The government starts this week to dredge a channel 200 feet wide through the sand bar which is 450 feet wide at the mouth of the canal. Whitehead & Kales Co. here starts soon to fabricate 4500 tons of structural steel for the initial unit of the plant proper. In the meantime other foundation and grading contractors are being pushed to complete work as soon as possible. The plan is to start production next fall. While Newton never has made a practice of buying sheet bars from a finished steel competitor, the fact that the new plant of the Great Lakes Steel Corp. will only be 20 to 25 miles away and it may at the start be a semifinished steel seller, may cause it to change this policy.

* * *

WHILE a year from next month is the date mentioned by some as the start of operations by the Great Lakes Steel Corp. at Ecorse, Mich., some believe three years hence will be the more correct date, since everything from open-hearth furnace to strip mill is involved, rolling mills, blooming mills, soaking pits, etc. However, a real start is being made. Architects are making indicative drawings for the plant. Rails for a railroad to the Zug island blast furnace, a distance of about three miles, were ordered last week. This followed the calling in of 30 per cent of the stock subscription money, about $6,000,000. This issue of $20,000,000 was over-subscribed by $10,000,000. Fabricators believe that since the Henry Ford open-hearth plant involved 12,000 tons of steel, the Great Lakes plant requirement will eventually exceed 20,000 tons but probably awards will be made on a unit basis. This interest's 150-acre site is two to three miles away from the present plant of the Michigan Steel Corp.

* * *

THERE has to be a first time for everything. Now for the first time an owner of the Ford Motor Co. and its subsidiaries, has accepted official capacity in an outside company. Edsel B. Ford, president, is to be a director of a new $30,000,000 corporation formed to develop and market German chemical products in the United States, the American I. G. Chemical Corp. Associated with him in this new departure will be representatives of the new Standard Oil Co. of New Jersey and of the German Chemical Trust.

* * *

BUICK'S new car unofficially named the Marquette, a light six, may make its bow as early as May 15. Buick's output at present, about 600 cars daily, is to be stepped up to 1500 daily by June or July, when the new models of its regular line are to be ready. Under the overlapping intricacies of General Motors merchandising, wherein many units of the General Motors group compete with each other, the Buick division requested a cheaper car to enable it to compete with the Oakland-Pontiac. Each unit always has stood on its own feet as far as outside competition is concerned, but now more than ever, is each division put on its own mettle to make a good showing, when the competition from within has become so keen.

* * *

FORD, having regained leadership in the automotive field, turning out some days as many as betwen 8000 and 8100 cars, including foreign assembly, appears unable to keep abreast of the demand. Unfilled orders on the books usually stand at 90,000 to 100,000 cars all the time.

* * *

WATER shipments of scrap to Cleveland, Erie, Pa., Buffalo and other lake ports are increasing each week. This is lending what support the market needs at the moment. Locally the market on auto cast and cast iron borings is adversely affected by the growing practice of large scrap producers among automobile builders of installing briqueting machines at a cost of approximately $75,000 apiece. These exercise such a terrific pressure upon the borings, they are fashioned into briquets which can be machined in a lathe. The makers of cast iron borings retain them for making briquets to be used in their own cupolas and they have the advantage of utilizing their own material and knowing its exact chemical analysis and just what it will do. This makes for a shortage of borings in the open market, with prices tending upward. It also creates a surfeit of auto cast, for which in times of stress users have paid as high as $25 to $28 per ton. At present the market is only $15 to $16 but which under the above practice brings about a saving of at least $5 per ton. Dodge, Chevrolet, Buick and Oakland are among those using briqueting machines. The Wilson Foundry & Machine Co. is installing one.

American Bosch Magneto Co., Smith & Wesson, Wason Mfg. Co., and the United Mfg. Co. were awarded safety banners by the Springfield, Mass., industrial safety division as group winners in the safety campaign for March.

Machinery

Sales Continue Along at a Rate Which Is Best for Any First Half Since War—Deliveries Remain Slow—Lathe Price Up

BUYING of machine tools and shop equipment continues at a high level, practically all territories showing good activity. A large volume of small orders rather than large individual orders is responsible for this condition. Perhaps the largest buyer of the week was the Western Electric Co. which has closed orders for new equipment totaling between $300,000 and $400,000 for its Baltimore plant. Additional orders still are under negotiation. Lycoming Motors Co. has taken a portion of its recent extensive list and other purchases will be made shortly. In many sections buying this year is the best for any corresponding period since the war, and as a result, tool builders are well booked and unable to give prompt delivery. Price advances still are noted.

New York, April 30.—Heavy buying still features the eastern machine tool market. One of the largest recent buyers is the Western Electric Co., which has closed on possibly $300,000 to $400,000 of equipment for its Baltimore plant. Orders for this plant have been placed in sharply increasing volume over the past two or three weeks and machine tools still are under negotiation. Fully 60 or more engine lathes have been placed and a large number of milling machines among other principal items. Another large buyer is the Lycoming Motors Co., Williamsport, Pa., noted in a recent issue as inquiring for an extensive list for a new department to be devoted to airplane engine manufacture. Further business still is to be placed.

Recent purchases by the Intertype Corp., Brooklyn, has brought that company's order up to 60 or 70 machines. This company, it is understood, is now virtually out of the market. Meanwhile, miscellaneous business continues active. Little doubt exists that buying in this district so far this year has exceeded that of any corresponding period since the war, and the end apparently is not in sight.

The crane market is featured by several sizable lists, including a new list from Chesapeake & Ohio railroad for 28 overhead cranes and 10 for Western Electric Co.

Worcester, Mass., April 30.—Machine tool sales, confined largely to individual awards, continue to hold the total at a high level, although in spots there is a slight recession. Delivery is a factor in placing new business and plant schedules are keyed up and generally meeting this situation. Railroads, buying for replacement only for some months, are expected to place some business soon to meet shop expansion requirements. Backlogs are heavy, Milling machines. lathes, automatics, grinding equipment and precision units are moving well and make up the bulk of the new business. There is also a brisk demand for drilling units. Machine motors are also experiencing a strong demand. Small tools are active. activity in used tools is confined largely to units of guaranteed performance. Machine parts are selling well.

Pittsburgh, April 30.—Slightly less activity is noted in the machine tool market. Although a fairly steady rate of orders and inquiry is being received, the pace is slightly slower than a month ago. Sellers still are encountering some difficulty in obtaining desired shipments from manufacturers, and the credit situation brought about by high money rates is beginning to have an adverse effect on new work. Some fairly large business remains pending, including one railroad list and the balance of tools on the second quarter list of the Westinghouse Electric & Mfg. Co. The crane market remains active from the standpoint of pending business although awards are lacking.

Chicago, April 30.—Machine tool sales in the week just closed maintained the general rate of buying for this month. Several distributors in this district expect the April volume to show a slight recession from March, while others report approximately the same volume as last month. April business is expected to be above the average of the past year, even among dealers experiencing a slight dip from March. Sales houses worked on five good-sized industrial lists for the Chicago district. Drills, lathes and milling machines were active. Erie railroad purchased two heavy-duty 36-inch shapers in this district for shipment to Ohio and western Pennsylvania. An industrial firm in the Chicago district purchased an engine lathe. Rock Island and Santa Fe made additional purchases against their recent lists, the latter road ordering several drills. Chicago & North Western also placed some business, and is asking bids on two pipe threading machines. Welding equipment and sheet metalworking tools were active. Several dealers report first quarter sales of lathes nearly twice those of first quarter last year. Sales of shapers also gained over last year's first quarter, but the increase was less marked. One lathe manufacturer has advanced prices about 7 per cent on two sizes.

Cleveland, April 30.—Activity in this market persists at a level which shows little change from week to week. Inquiries are being received from all directions with no particular industry holding a dominance. The fact that dealers can do little in the way of prompt delivery seems to exert no deterring effect. It is apparent that the Cleveland territory has returned to a position of importance in machinery sales, following a slump for two years. One evidence of the comeback is the fact that at least two tool manufacturers have opened direct factory offices to replace dealer representation.

CRANE ORDERS PLACED

Four 15-ton crawler cranes for Rogers & Haggerty, New York contractors, to Ohio Power Shovel Co.; these are in addition to five recently awarded the same company.

Crawler cranes for Patrick McGovern Inc., New York, to Industrial-Brownhoist Corp.

Among single orders were: 25-ton locomotive crane for northern New York state purchaser, to Browning Crane Corp.; 2-ton truck crane for Carleton Construction Co., New York, to Otis Engine Co.; 2-ton special truck crane for Holland Vehicular tunnel commission, New York, to Otis Engine Co.; shovel crane equipped with 3-yard bucket for Lima Stone Co., Lima, O., to Bucyrus-Erie Co.

CRANE ORDERS PENDING

Twenty-eight overhead cranes for Chesapeake & Ohio railroad, bids asked. Specifications call for 24 2½-ton 3-motor floor-controlled cranes and four 5-ton cranes. These are in addition to a large number recently placed by this railroad.

Ten electric overhead cranes, mostly of 10-ton capacity, for new plant of Western Electric Co., Baltimore.

Several 8-wheel locomotive cranes for New York Central; contemplated but no inquiry issued.

6-ton used crane equipped with grab bucket, for American Zinc Co., East St. Louis, Ill.

10 or 15-ton used electric crane for A. H. Cohn & Sons, Butler, Pa.

Urges Proper Equipment

Stressing the importance to a jobbing foundry of adequate material handling equipment and proper arrangement, F. D. Campbell, chief engineer of Eastern Steel Castings Co., Newark, N. J., was principal speaker at the regular monthly meeting of the Newark Foundrymen's association, Newark, N. J., April 24. With the aid of lantern slides he described the system of labor handling equipment recently installed in the Eastern Steel Castings plant where more than 75 per cent of the orders are for quantities of 50 or less and the great percentage of the work is in light castings.

British Markets More Active

More Blast Furnaces Starting as Exports Increase—Steel Demands Also Expanding, Colonies Ordering Rails and Cars—Competition from Continent Reappearing, with Slower Sales in Belgium, France, and Germany

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, April 30.—(*By Cable*)—While markets on the Continent are less satisfactory this week, a distinct improvement is noted in Great Britain. A shortage of pig iron is reported in the Middlesbrough and Barrow districts and several blast furnaces are being lighted. Exports of pig iron from Middlesbrough are more active, and at this date are 8000 tons ahead of the comparable days in March. Makers of hematite are selling tonnage well into the third quarter.

British steelworks operations also are increasing in response to a better demand for finished material. Exports are expanding, and shipyards are busier. Semi-finished demand is active. Competition from continental steelworks is reappearing. Strip steel from the Continent is selling at £7 10s ($36.37), delivered in the Midlands, £1 less than the British domestic price. The market for tin plate is satisfactory, continental users buying from British mills. Demand for galvanized sheets is dull.

Dorman, Long & Co. have obtained an order for 40,000 tons of rails for shipment to South Africa. British colonies also have ordered 400 steel railroad cars. A Sheffield firm has booked a substantial order for magnet steel for delivery to Holland.

A report from Paris states the iron and steel markets are less satisfactory, though the comptoirs are maintaining prices. Belgian markets are quieter, sales decreasing. Berlin reports export markets active, but weak.

British Steelmakers Avoid Advancing Prices

BIRMINGHAM, Eng., April 19.—(*European Staff Service*)—The British steel output for March, totaling 859,900 tons, was the largest for any month since March, 1927, and compares with 774,900 tons in February. It is an indication of the steady recovery taking place in the trade and confirmation of the fact that a much larger share of business is being handled by British steel mills, with a consequent decline in the purchase of foreign steel. The Steel Manufacturers association, which controls the price of structural steel, met in London this week and decided to leave prices unchanged.

Sterling $4.85

Shipbuilding is absorbing larger quantities of steel and automobile builders are pressing strongly for special steels used in their factories. There is active demand for billets, sheet bars and tin plate bars. For the latter mills in South Wales are firm at £6 6s 3d ($30.61), delivered. Birmingham merchants who formerly sold foreign steel complain of the slow state of business. One line, however, which is still bought in good quantities is steel strip which motor and motorcycle accessory makers prefer in some cases. It shows a saving of about £1 ($4.85) a ton compared with the domestic product. Belgian No. 3 iron for nut and bolt making is largely used in Staffordshire. Strong demand exists for small English steel bars at £8 5s ($40.01) up-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 29	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$16.61	3 8 6*	$17.46	3 12 0	$17.46	3 12 0	$16.49	3 8 0
Basic	16.13	3 6 6	16.73	3 9 0	16.73	3 9 0	15.76	3 5 0
Basic-bessemer	17.58	3 12 6†	16.73	3 9 0	16.73	3 9 0	15.76	3 5 0
Hematite, Phosphorus 0.02-0.05	17.95	3 14 0	23.66	605*	.....	.....	17.46	3 12 0
SEMIFINISHED STEEL								
Billets	$31.53	6 10 0	$26.19	5 8 0	$26.19	5 8 0	$25.22	5 4 0
Wire rods	41.83	8 12 6	30.92	6 7 6	30.92	6 7 6	30.92	6 7 6
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$32.01	6 12 0
Merchant bars	1.79c	8 5 0	1.33c	6 1 0	1.33c	6 1 0	1.34c	6 2 0
Structural shapes	1.60c	7 7 6	1.12c	5 2 0	1.12c	5 2 0	1.12c	5 2 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.39c	6 6 0	1.39c	6 6 0	1.40c	6 7 0
Sheets, black, 24 gage	2.17c	10 0 0	2.26c	10 5 0	2.26c	10 5 0	2.50c	11 7 0
Sheets, galvanized, 24 gage, corrugated	2.90c	13 7 6	3.01c	13 13 9	3.01c	13 13 9	3.43c	15 12 0
Bands and strips	2.17c	10 0 0	1.40c	6 7 6	1.40c	6 7 6	1.40c	6 7 6
Plain wire, base	2.06c	9 10 0	1.71c	7 15 0	1.71c	7 15 0	1.74c	7 18 0
Galvanized wire, base	2.93c	13 10 0	2.12c	9 12 6	2.12c	9 12 6	2.18c	9 18 0
Wire nails, base	2.39c	11 0 0	1.79c	8 2 6	1.79c	8 2 6	1.85c	8 8 0
Tin plate, base box 108 pounds	$ 4.49	0 18 6	.....	.....	.....	....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.61	3 8 6	$18.57	475(2)	$17.24	620	$18.48 78
Basic pig iron	15.76	3 5 0	19.94	510(1)	16.96	610	20.86 88
Furnace coke	3.64	0 15 0	6.06	155	5.84	210	5.10 21.50
Billets	31.53	6 10 0	24.24	620	26.27	945	28.69 121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c 140
Merchant bars	1.84c	8 10 0	1.36c	755	1.40c	1,075	1.52c 141
Shapes	1.71c	7 17 6	1.31c	730	1.22c	940	1.49c 138
Plates, ship, bridge and tank	1.87c	8 12 6‡	1.54c	855	1.46c	1,120	1.71c 158
Sheets, black, 24-gage	2.28c	10 10 0	2.92c	1,620	2.70c	2,080	2.43c 225
Sheets, galvanized 24 gage, corrugated	2.93c	13 10 0	3.69c	2,050	3.84c	2,950	3.78c 350
Plain wire	2.06c	9 10 0	1.94c	1,075	2.08c	1,600	2.48c 230
Bands and Strips	2.17c	10 0 0	1.51c	840	1.76c	1,350	1.77c 164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 15s 0d ($3.64) f. o. b. Ferromanganese £21 13s, 0d ($105.00) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.75) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

ward, and some works are weeks behind in delivery. Offers of Continental steel bars arrived in Birmingham this week, but are not very attractive at £7 5s ($35.16), delivered.

Production of pig iron in March was not the largest within the past twelve months, but it has been exceeded by only a few hundred tons. The total was 590,500, compared with 519,600 tons in February and 592,600 in March, 1928. The daily rate increased from 18,557 tons in the previous month to 19,048, while the total of 145 furnaces was an increase of five. Basic iron formed the largest share of this output, totaling 251,200 tons, and there is still pressing need for this quality in view of increased activity in the steel trade. The shortage of basic iron and steel scrap is a serious factor and the Continent is taking large quantities of scrap. Supplies of blast furnace coke are more plentiful so that in the North of England expansion of production is entered upon with more confidence and two furnaces are to be started by Jarrow & Co. on Tyneside. Pig iron makers in Middlesbrough have scarcely any iron to sell before June, and from the end of that month prices are quoted 1s 6d ($0.36) higher than the fixed basis. Similarly with hematite little east coast material is on offer for early delivery and merchants are not pressing sales.

Pig iron buying in the Midland district is quiet. Consumers have booked as far forward as they care to go, and the only sales are of special parcels for prompt delivery.

Middlesbrough makers of common bar iron have advanced prices 10s ($2.42) a ton in view of dearer raw material, and Staffordshire iron values also tend upward. Marked bar makers, like the Steel association, are content to trade on the old basis, although an advance is justified both in finished iron and steel. But in the next lower quality of Staffordshire iron, known as crown iron, the minimum price has advanced and inquiry is more active.

Exports of galvanized sheets for first quarter totaled 218,495 tons, compared with 177,782 in the same period of last year. On the month, however, there was a falling off of about 4000 tons and export inquiries during the last week or two have been rather scarce. Prices are steady at £13 7s 6d ($64.86) to £13 10s ($65.46).

Exports of tin plates show improvement both on the monthly comparison and the quarterly. The February total was 419,600 tons and in March 49,027. The first quarter of this year shows an increase of about 8000 tons compared with the first quarter of 1928, and there is every reason to believe that shipments in April will be maintained on a high level. Many works are booked to the end of June and some consumers are inclined to order for delivery in second half. Prices are firm at 18s 6d ($4.48) as the general figure with higher quotations at certain works. A meeting of the sliding scale committee of the trade was held at Swansea this week. Workers are pressing for a new sliding scale to replace that which has been in operation for two years, based on the price of tin plate bars. Some progress was made but consideration of the matter was adjourned.

British Steel Exports Low in March

London, April 16.—(*European Staff Service*)—British board of trade returns for March show a total export of iron and steel products, including scrap, of 382,647 tons, compared with 417,127 tons in February and 445,088 tons in March, 1928. Imports, including scrap, totaled 183,641 tons, against 163,474 tons in February and 273,780 tons in March, 1928.

Exports during March showed a further falling off compared with February, although March was a longer month; the figure also was lower than that of a year ago. However, reports since the beginning of April seem to indicate that this month will see a revival of export trade. Exports of pig iron in March amounted to 37,767 tons, of which 10,286 tons went to Italy and 2500 tons to the United States. In March last year Italy took only 1364 tons, and the United States received 13,122 tons. Galvanized sheets exported during the month totaled 65,972 tons, the best market being India, where 28,916 tons were shipped. Tin plate exported was 49,027 tons. Of steel rails, 21,734 tons were shipped to foreign markets, the Argentine republic taking 7241 tons.

Whereas exports fell away in March, the tonnage of imports slightly increased, but remained well below the January figure of 246,962 tons, and were 19,000 tons less than a year ago. Principal items imported into Great Britain were ingots and semifinished steel, 60,951 tons, of which 31,805 tons were sheet bars and tin plate bars.

French Coke Declines

Paris, April 16.—(*European Staff Service*)—Output of coke at French collieries during February was slightly below January. February imports included 283,481 tons from Germany, 66,621 tons for Holland, 49,644 tons from Belgium, and 1102 tons from Great Britain.

Exports of coke from France included: Italy, 21,018 tons; Switzerland, 9669 tons; Belgium and Luxemburg, 2120 tons; followed by Spain, Morocco and other countries. The following table gives figures, in metric tons:

	Metric tons		
Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1926	313,950	462,915	39,320
1927	339,015	395,580	33,430
1928	366,660	447,330	34,810
1929			
Jan.	384,519	438,059	37,443
Feb.	360,182	400,848	34,165

Iron Comptoir Formed

Paris, April 16.—(*European Staff Service*)—The new French hematite comptoir now is operating, with head offices at 30, rue de Pétrograd, Paris. This organization has for its object the handling of sales of pig iron, and especially hematite pig iron, in all countries. The original capital is 100,000 francs ($3800) in 100-franc shares. The board is composed of a number of iron and steel companies. This comptoir will allocate orders to its members and fix minimum prices.

German Trade Slackens

Berlin, April 16.—(*European Staff Service*)—Exports of pig iron, ferroalloys, castings and steel products from Germany in February were below those of January. Among principal items exported in February were: Merchant bars, hoops and bands, 69,902 tons; wire and wire rods, 32,232 tons; plates and black sheets, 27,830 tons; rails and track material, 23,310 tons; tubes, 19,472 tons; semifinished steel, 18,402 tons. Scrap exports were 33,174 metric tons.

Imports of these materials in February were also below those of January. Among principal items were merchant bars, hoops and bands, 45,525 metric tons, which constituted by far the most important item, while scrap imported totaled 11,220 tons. The following table gives figures, in metric tons:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1926	9,230	95,890	42,730	402,905
1927	23,895	217,505	29,910	347,645
1928	25,535	174,250	24,585	394,575
1929				
Jan.	22,334	154,293	31,820	387,769
Feb.	10,595	101,257	20,861	320,451

1928 Profits Are Larger

Brussels, April 16.—(*European Staff Service*)—The ordinary meeting of Trust Metallurgique Belge-Francais was held recent. Net profit for 1928 was 15,059,441.70 francs ($416,000), compared with 4,757,560.27 francs ($132,000) in 1927.

The report of this concern is of interest, because it is a holding company which has important investments in a number of iron and steel, mining and electrical companies in Belgium, France and other foreign countries.

Among the principal companies relating more especially to iron and steel and heavy engineering are the Societe des Acieries de Longwy in France, the Ateliers de Construction du Nord de la France, both important French concerns, Societe LaBrugeoise et Nicaise et Delcuve and the Societe des Forges et Acieries Nestor Leonard, both in Belgium, Societe des Hauts-Fourneaux et Usines d'Ostrowice and Societe Varsovienee pour la Construction de Locomotives, in Poland, all of these companies having registered satisfactory results during the year under review. Other concerns in which the trust is interested are power plants, mostly situated in Poland, and the Societe Industrielle et Miniere du Congo Oriental in Belgian Congo, which exploits tin mines in the Congo and also controls a certain interest in a number of other mining concerns, including the Tanganyika Goldfields, Ltd.

Trade Balance Is More Favorable

March Exports of Iron and Steel Heavier as Imports Shrink—First Quarter Showing One of Best—Receipts of Pig Iron Are Halved

EXPANDING exports and declining imports of iron and steel products in March further improved the industry's foreign trade balance. Exports of 270,925 gross tons in March made a good gain over the 259,711 tons of February and the 221,935 tons of last March, though falling somewhat short of the 274,296 tons of January, 1929.

Imports of iron and steel, as reported by the iron and steel division, department of commerce, Washington, were 52,622 tons in March, against 58,146 tons in February and 74,128 tons last March. March receipts from abroad were the lowest for any month since last July.

In March the excess of iron and steel exports over imports was 218,303 tons, while in March, 1928, the favorable balance was only 147,807 tons. In the first quarter of 1928 exports of 804,932 tons outweighed imports of 165,561 tons by 639,371 tons. This was almost 50 per cent greater than the favorable balance of 432,080 tons in the opening quarter of 1928. The first quarter showing is one of the best in peacetime history.

The export trade of the United States in iron and steel products suffered a slight decrease in daily tonnage shipped in March compared with the preceding month, the 11,214-ton gain during the month being in total tonnage rather than in daily shipments. Shipments increased in 26 classes of products, while losses were registered in 16. The principal gains registered this month were those in scrap, 14,510 gross tons; steel bars, 6433 tons; ingots, blooms, etc., 4256 tons; and plain structural shapes, 3152 tons. Against these gains there appeared losses in casing and oil line pipe, 6640 tons; fabricated structural shapes, 6623 tons; rails, 4872 tons; plates, 3850 tons; galvanized sheets, 3691 tons; tin plate, 2209 tons; and black steel sheets, 2073 tons.

Principal products exported during March were scrap, which went chiefly to Canada, Poland, Italy, and Japan; plain structural shapes, which went to Canada and Japan; tin plate, which went to Canada, Japan, Argentina and China; steel bars, of which Canada, Japan and the United Kingdom were the largest purchasers; black steel sheets, which were sent to Canada, Japan and France; plates, most of which Canada purchased; galvanized sheets, of which Canada, the Philippine Islands and Java and Madura were the principal takers; black and galvanized welded pipe which went to Japan, Colombia, and the United Kingdom; casing and oil line pipe which was purchased chiefly by Venezuela and the Netherland East Indies; and steel rails which were sold mainly to Chile and Canada. Canada was the leading market for the seven

IMPORTS AND EXPORTS

Gross Tons

	—1929—		—1928—	
	Imports	Exports	Imports	Exports
Jan.	54,793	274,296	58,635	205,766
Feb.	58,146	259,711	48,756	185,907
March	52,622	270,925	74,128	221,935
3 mos.	165,561	804,932	181,528	613,608
March	.....	.....	74,128	221,935
April	.....	.....	71,579	215,184
May	.....	.....	72,106	267,890
June	.....	.....	65,819	262,052
July	.....	.....	47,830	253,336
Aug.	.....	.....	69,914	287,297
Sept.	.....	.....	57,782	228,056
Oct.	.....	.....	63,880	256,870
Nov.	.....	.....	67,103	256,886
Dec.	.....	.....	55,199	221,810
Total	.....	.....	782,694	2,862,997

ORIGIN OF FERROMANGANESE IMPORTS

Gross Tons

From	March	Feb.
Canada	2,919	1,967
United Kingdom	2,071	428
Norway	910	719
France	8	71
Italy	187	140
Total	6,095	3,325

ORIGIN OF PIG IRON IMPORTS

Gross Tons

From	March	Feb.
United Kingdom	4,700	4,540
Netherlands	2,465	4,349
British India	1,107	6,974
Norway	156	50
Mexico	33	31
Sweden	111	177
Canada	.....	95
Germany	.....	50
Belgium	.....	33
Total	8,572	16,299

ORIGIN OF MANGANESE IMPORTS

Gross Tons

From	March	Feb.
Soviet Russia in Europe	7,410	9,122
Brazil	63	7,406
British India	7,682	4,124
Gold Coast	2,801	.....
Canada	133	.....
Total	18,089	20,710

ORIGIN OF IMPORTS

Gross Tons

From	Ingots, blooms, etc.	Steel scrap	Cast iron pipe	Steel bars
Austria	1	.....	.....	29
Belgium	773	.....	22	286
France	678	.....	4,452	74
United Kingdom	44	26	27	120
Sweden	160	44	.....	1,151
Germany	15	41	.....	192
Canada	9	6,274	1	6
Czechoslovakia	1	.....	.....	8
Italy	.....	78	.....	.....
Norway	.....	.....	.....	2
Total	1,601	6,463	4,502	1,868

ORIGIN OF IRON ORE IMPORTS

Gross Tons

From	March	February
Sweden	25,815	7,080
Chile	117,470	152,971
Cuba	55,000	64,000
Mexico	21,457	.....
Canada	40	24
Algeria and Tunis	3,460	5,580
Egypt	7,400	.....
Spain	20	6,960
Brazil	9,450	.....
Venezuela	1	.....
British India	4,000	.....
United Kingdom	50	.....
Australia	.....	4,499
Total	244,163	240,934

IMPORTS OF IRON AND STEEL

(Gross Tons)

Item	March 1929	Feb. 1929	January through March 1929	March 1928
Pig iron	8,572	16,299	40,979	33,669
Ferro-manganese and alloys (1)	6,095	3,325	14,922	10,875
Ferrosilicon (2)	967	794	2,207	845
Ferrochrome (3)	36	15	79	188
Scrap	6,463	8,524	22,194	9,215
Steel ingots, blooms, billets, etc	1,681	1,841	5,239	4,469
Steel bars	1,868	2,751	7,753	26,683
Iron bars	216	335	790	460
Wire rods	1,365	595	3,143	5,399
Hoops, bands, and scrolls	1,012	1,536	3,730	7,880
Boiler and other plate	....	982	1,055	380
Sheets, skelp and sawplate	2,147	923	3,897	8,490
Tin Plate	31	17	89	69
Structural shapes	11,302	9,017	29,789	41,817
Rails and splice bars	157	743	971	4,271
Cast iron pipe	4,502	3,648	10,910	13,276
Other pipe and tubes	3,823	4,807	11,289	7,946
Barbed wire	617	349	1,251	986
Round iron and steel wire	584	540	1,726	971
Steel telegraph and telephone wire	....	....	....	36
Flat wire and strip steel	119	167	435	588
Wire rope and strand	323	153	609	406
Other wire	61	38	140	188
Nails, tacks, and staples	547	558	1,813	1,646
Bolts, nuts, rivets, and washers	26	23	67	65
Castings and forgings	148	166	524	1,263
Total	52,662	58,146	165,601	182,081

(1) Manganese content
(2) Silicon content
(3) Chromium content

principal products exported in March.

Germany was the principal source of the iron and steel products imported into the United States in March with a total trade of 12,907 tons, of which 5651 tons was shapes, 2776 tons, "other" pipe, 1762 tons, sheets, skelp and saw plate. Next in order was Canada with a total of 10,684 tons, 6274 tons being scrap and 2919 tons ferro-manganese. During the month the United Kingdom exported 8045 tons of ferrous products to this country, of which 4700 tons was pig iron and 2071 tons ferromanganese. Of the French total of 6753 tons, 4452 tons was cast iron pipe and 1053 tons shapes. Of the Belgian total of 6320 tons shapes was the chief item.

EXPORTS OF IRON AND STEEL

(Gross Tons)

Item	March 1929	Feb. 1929	January through March 1929	January through March 1928
Pig iron, not including ferro-alloys	4,083	4,118	11,970	12,253
Ferromanganese and spiegeleisen	525	42	735	2,139
Scrap	36,062	21,552	108,367	85,928
Ingots, blooms, etc.	5,031	775	7,707	6,804
Skelp, iron and steel	6,432	4,249	13,500	18,448
Iron bars	1,080	337	1,728	792
Steel bars	23,823	17,390	63,619	30,566
Alloy steel bars	3,107	3,102	7,994	2,796
Wire rods	4,588	3,539	12,538	7,449
Plates	15,115	18,965	51,465	33,991
Galvanized sheets	13,978	17,669	48,070	37,926
Black steel sheets	16,576	18,649	48,690	44,135
Black iron sheets	1,351	1,175	3,529	3,256
Hoops, bands and strip steel	8,660	6,740	22,291	12,434
Tin plate, terneplate, etc.	24,478	26,687	77,552	60,552
Structural shapes, plain material	24,685	21,533	63,477	38,366
Structural shapes, fabricated	8,067	14,690	33,499	16,731
Metal lath	419	560	1,553	1,130
Steel rails	11,277	16,149	46,309	53,941
Rail fastenings, switches, frogs, etc.	2,686	2,785	8,098	19,153
Boiler tubes	1,754	1,818	5,096	4,563
Casing and oil line pipe	12,351	18,991	47,672	26,740
Black and galvanized welded pipe	13,829	12,096	36,269	28,338
Malleable iron screwed pipe fittings	1,068	1,093	3,296	2,060
Cast iron screwed pipe fittings	1,590	780	3,092	1,475
Cast iron pressure pipe and fittings	1,142	974	2,629	4,504
Cast iron soil pipe and fittings	1,070	666	2,758	3,230
Plain wire	5,341	5,498	14,684	12,044
Barbed wire and woven wire fencing	6,576	5,642	18,747	17,030
Wire cloth and screening	151	201	504	477
Wire rope	749	724	2,093	1,479
Insulated wire and cable	157	66	386	147
Other wire and manufactures of	1,003	1,099	3,028	2,348
Wire nails	2,051	1,589	5,138	3,687
Nails other than wire	1,080	671	2,587	2,122
Tacks	72	44	174	227
Horseshoes	77	26	124	112
Bolts, nuts, rivets, except track	1,716	1,299	4,406	2,930
Car wheels and axles	3,293	1,579	7,690	3,560
Iron castings	1,372	1,270	3,823	3,663
Steel castings	735	1,339	3,518	2,517
Forgings	1,725	1,560	4,527	1,479
Total	270,925	259,711	804,932	613,522

DESTINATION OF MARCH IRON AND STEEL EXPORTS

Gross Tons

	Rails	Galvanized sheets	Plates not fab.	Tin, terne plate	Black sheets	Barbed wire	Steel bars	Steel scrap
Argentina	.....	517	46	1,884	.....	517	.....	.....
Australia	.....	6	239	.....	130	20	.....	.....
Belgium	.....	.....	.....	.....	.....	.....	.....	111
Brazil	301	296	.....	126	.....	1,360	546	.....
British India	.....	638	.....	.....	.....	.....	.....	.....
British Malaya	.....	.....	.....	.....	.....	.....	.....	.....
British S. Africa	.....	38	.....	.....	.....	396	.....	.....
Canada	1,958	3,232	13,230	5,017	9,115	345	10,923	10,010
Central America	1,192	570	178	.....	28	465	546	.....
Chile	3,552	194	106	631	.....	.....	.....	.....
China	.....	373	.....	1,729	.....	.....	160	1,326
Colombia	1,417	546	3	26	.....	298	.....	.....
Cuba	.....	536	13	1,024	.....	231	496	.....
Dutch E. Indies	.....	328	.....	55	.....	.....	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....
Europe	.....	.....	12	.....	748	.....	56	.....
Other Europe	.....	.....	.....	59	.....	.....	.....	.....
France	.....	.....	.....	.....	1,086	.....	.....	.....
Greece	.....	.....	.....	873	.....	.....	.....	.....
Germany	.....	.....	.....	.....	.....	.....	.....	2,494
Italy	.....	.....	.....	455	.....	.....	.....	7,817
Japan	964	108	.....	7,886	2,449	.....	5,256	4,204
Java and Madura	.....	1,394	.....	366	.....	.....	.....	.....
Kwantung	.....	.....	.....	.....	.....	.....	.....	660
Mexico	106	928	.....	556	381	565	66	136
Norway	.....	224	.....	.....	.....	.....	.....	.....
Peru	90	.....	52	571	101	.....	470	.....
Philippine Islands	704	2,391	140	909	785	869	1,443	.....
Poland	.....	.....	.....	.....	.....	.....	.....	8,921
Soviet Russia	.....	.....	.....	.....	.....	.....	.....	.....
United Kingdom	.....	.....	.....	.....	37	.....	3,549	206
Uruguay	.....	.....	.....	390	.....	.....	.....	.....
Venezuela	78	.....	.....	.....	.....	.....	.....	.....
Total	11,277	13,978	14,474	24,478	16,576	6,041	23,823	36,062

Imports of iron ore in March increased slightly over the February total of 240,924 tons to reach 244,163 tons—117,470 tons of the March trade being of Chilean origin, 55,000 tons Cuban, 25,815 tons Swedish, and 21,457 tons Mexican. Some smaller tonnages were also received from Brazil, Egypt, British India, Algeria and Tunisia.

DESTINATION OF EXPORTS

Gross Tons

Country of destination	March 1929	January thru March 1929	January thru March 1928
North and Central America and the West Indies	135,333	379,520	288,689
Canada & Newf'dland	113,359	303,241	231,449
Cuba	5,273	18,018	16,801
Guatemala	1,039	2,050	4,364
Honduras	1,890	4,690	2,146
Panama	1,435	6,668	4,507
Salvador	492	2,515	731
British West Indies	1,598	9,096	1,763
Other West Indies	3,116	9,305	4,759
Other Central America	7,131	23,937	22,169
South America	41,170	133,445	104,242
Argentina	8,337	33,963	23,571
Brazil	3,792	17,246	20,211
Chile	8,034	17,480	18,120
Colombia	7,084	16,461	16,825
Peru	3,483	12,070	8,269
Uruguay	967	4,457	1,799
Venezuela	8,874	30,372	13,970
Other South America	599	1,396	1,477
Europe	32,460	91,586	39,724
Belgium	894	1,120	3,699
France	1,447	7,079	810
Greece	888	1,011	117
Italy	8,776	32,222	4,011
Netherlands	462	878	796
Rumania	457	934	693
Soviet Russia in Europe	407	1,404	1,222
United Kingdom	6,119	15,891	13,262
Other Europe	13,010	31,047	15,114
Far East	59,350	194,082	176,519
British Malaya	341	3,071	1,921
China	4,776	22,849	32,957
Netherland East Indies	8,062	26,364	6,403
India and Ceylon	1,243	7,421	9,620
Japan and Chosen	30,430	90,238	91,884
Kwantung	1,389	6,451	1,870
Philippine Islands	11,108	26,577	25,484
Australia	1,309	5,636	4,478
New Zealand	198	1,168	496
Other Asia and Far Eastern Markets	494	4,307	1,406
Africa	2,612	6,299	4,348
British South Africa (Union of)	1,190	1,936	2,139
Egypt	1,054	3,488	1,419
Mozambique	105	255	208
Other Africa	263	620	582

Exports of Metalworking Machinery

(In number except where otherwise specified)

	March 1929	March 1928	January through March 1929	January through March 1928
Engine lathes	86	95	230	230
Turret lathes	90	29	174	85
Other lathes	86	33	219	142
Vertical boring mills and chucking machines	26	12	89	26
Thread-cutting and automatic screw machines	77	90	247	230
Knee and column type milling machines	57	33	131	87
Other milling machines	89	47	219	179
Gear-cutting machines	44	26	121	81
Vertical drilling machines	49	75	124	135
Radial drilling machines	18	16	36	47
Other drilling machines	125	80	494	179
Planers and shapers	45	37	145	113
Surface grinding machines	21	.....	28	.....
External cylindrical grinding machines	99	81	264	250
Internal grinding machines	46	38	131	117
Tool grinding, cutter grinding, and universal grinding machines	79	48	279	138
Pneumatic portable tools	2,464	1,909	6,296	4,984
Chucks for machine tools	1,628	744	5,407	2,639

Reinforcing Steel Industry Must Know Its Engineering Costs

Concrete Reinforcing Steel Institute Holds Fifth Annual Meeting at Asheville, N. C.—Trade Practice Conference Proposes Rules for Business

MEMBERS of the Concrete Reinforcing Steel institute holding their annual meeting in Asheville, N. C., April 15-17, were told that if their industry is to be placed on a firm foundation, guesswork in engineering costs must be eliminated. This was the warning of W. S. Thomson, chief engineer, Kalman Steel Co., Chicago, in addressing the meeting on the subject of engineering costs. The speaker said that during 1928 members of the institute shipped over 500,000 tons of bars and spirals with at least 70 per cent of it requiring engineering service of some kind and entailing a cost of well over $1,000,000. He ventured further that whatever the cost, the engineering income received was considerably less than the cost of service rendered, suggesting the need for more accurate knowledge of costs.

Portions of Mr. Thomson's address follow:

Engineering costs consist of two major items—payroll and the incidental expense incurred in operating the department. These items represent the bare cost, exclusive of any sales or administrative expense, and must form the basis for determining a fair service charge on contracts in each of the three tonnage groups.

The one element of cost that is definitely known, is our payroll. If this were all we had to account for the problem would be relatively simple, but unfortunately there are numerous other items that enter the picture to form that somthing we call overhead. We cannot overlook it or thrust it into the background. It is there and must be accounted for. In our own organization, each of the following items or its proper proportion, is charged to the engineering department in addition to the payroll: Traveling; rent; heat, light and power; stationery and printing; blue printing; postage; telephone and telegraph; insurance; depreciation; overtime; cost of errors; miscellaneous; outside estimating and outside engineering.

An inspection of these items reveals the fact that they cover perfectly legitimate charges against the department, and as they will probably represent an addition of approximately 50 per cent to payroll expense, should by no means be overlooked in arriving at the tonnage costs in the various groups.

To translate this system into terms of cost based on the engineering tonnage actually sold, requires a reasonably accurate knowledge as to the number of tons that must be estimated in each group in order to sell one ton. Experience would indicate that the ratio of tons estimated to tons sold is closely as follows for the three groups: List 2; take-off 7; design 5.

This simply means in the "take-off" group, for example, that in order to get back your estimating cost for this group you must multiply the actual cost by 7 and add the result of the cost of detailing for the same group. The result will represent the unit engineering cost for the tonnage in that classification actually sold. This is an extremely important principle which must be recognized in establishing a basis for pricing.

Computing Engineering Costs

Five general principles are to be observed as follows:

1. *DIVISION OF WORK* Separate the work passing through the engineering department into two divisions. One to be known as the "estimating division" and the other the "designing and detailing division"

2. *DIVISION OF TONNAGE* When estimates are received by the engineering department the engineer in charge of the office should determine whether the tonnage involved falls in the "list," "take-off" or "design" groups for entry on the tonnage form. Having done this he assigns the letter L, T or D to the estimate number. By this device anyone who works on the estimate knows under what tonnage group to enter his time. Should the estimate become a contract, the letter following the estimate number indicates automatically the tonnage group under which it falls in the "designing and detailing division" and is the detailer's guide for the distribution of his time.

3. *DIVISION OF COST* Supply each engineering department employed with a time chart or form on which he may enter the number of hours daily spent on any of the tonnage groups. Collect these cards at the close of the month and from the employes known rate calculate the direct labor cost—plus its proportion of the item "supervision"—that applies to each tonnage group. Total the group costs from the several time cards and to these figures add the proper percentage for overhead. The unit cost for the tonnage in any group is obtained by dividing the group cost by the tonnage in that group.

4. *APPLICATION TO PRICING* Determine the ratio of tons estimated to tons sold in each tonnage group. The ton cost for estimating in any group should then be multiplied by the group ratio and the figure thus obtained added to the cost of detailing in that group. The combined figure represents the engineering cost per ton on the volume of tonnage actually ordered by the engineering department. If the engineering fee included in your sale price is less than this amount, you can depend upon it that you are giving away service and your engineering department is bound to show a loss.

5. *TIME ELEMENT* Figures covering only a short period, as one month for instance, are not of great value to one company as you will have cost for work performed during the month for which the tonnage may not be ordered out until the following month. This would produce apparently high unit costs. Monthly figures from a group of companies are of value, however, because the same conditions would not exist in all of the companies at the same time hence the group average would be useful as an index.

To the individual organization the figures that are of value are those accumulated over a long period of time, a year for example, for in that period any inequalities inherent in the method or in its application, are pretty well ironed out.

Another paper well received by the convention was "A New Market for Reinforcing Steel," by W. D. M. Allan, manager, cement products bureau, Portland Cement association, Chicago. An abstract of this paper appears on page 1191 of this issue of IRON TRADE REVIEW.

George E. Routh Jr., vice president, Kalman Steel Co., Chicago, president of the institute, stated in his annual

report the opinion that the sales organizations were responsible for the inadequate financial returns of the industry. He felt that the institute would be well repaid in organizing a school for salesmen to teach salesmanship instead of order taking. During the last six months steel mills have co-operated splendidly and their refusal to cut reinforcing bars to length has been of material benefit to the industry. Although no increase over 1928 in the volume of business during 1929 is anticipated, the total is expected to equal that of last year.

Members of the institute voted to set up a new department to deal with concrete ribbed floor construction. The following companies were admitted to membership in the organization: Capitol Steel Corp., Lansing, Mich.; Genesee Bridge Co. Inc., Rochester, N. Y.; Hudson-Daugherty Co., Washington.

At the business meeting, C. Louis Meyer, president, Concrete Engineering Co., Omaha, Neb. was elected president and O. W. Irwin, vice president, Truscon Steel Co., Youngstown, O., was chosen vice president. Hugh J. Baker, president, Hugh J. Baker & Co., Indianapolis, was re-elected treasurer. Charles M. Gunn, president, Gunn, Carle & Co., San Francisco, and George E. Routh Jr., the retiring president, were both re-elected to the board with Louis J. Lind, president, Carlem Engineering Co., Pittsburgh, selected as a new member. M. A. Beeman was reappointed secretary and R. W. Johnson reappointed engineer, with headquarters in the Tribune Tower, Chicago.

On April 18, the day following the close of the institute meeting, a trade practice conference was held under the auspices of the federal trade commission with Commissioner Garland S. Ferguson Jr., presiding. A number of rules covering the reinforcing steel industry were proposed and after an extended discussion were adopted for submission to the trade commission. These rules comprised such subjects as: Inducing breach of contract, misbranding or misrepresentation, secret rebates, price discrimination, illusory contracts, commercial bribery, published prices, single bid policy, dumping, arbitration, standard contracts, departures from terms of discounts, itemized quotations, nonmutual contracts, cost accounting and indefinite contracts.

The conference created an executive committee of seven members as a continuing organization to act for the progressive elimination of unfair and uneconomic practices in the reinforcing steel fabricating and distributing industry. The committee consists of the following members: C. Louis Meyer, Concrete Engineering Co., Omaha, Neb.; O. W. Irwin, Truscon Steel Co., Youngstown, O.; W. H. Pouch, Concrete Steel Co., New York; George E. Routh Jr., Kalman Steel Co., Chicago; R. J. Southwell, Wickwire-Spencer Steel Co., New York; A. E. Roeth, Inland Steel Co., Chicago; and W. W. Scott Jr., Laclede Steel Co., St. Louis.

Republic To Weld Large Pipe Electrically

Expansion plans of the Republic Iron & Steel Co., announced at the annual meeting April 17, include a complete electric welding pipe mill, using patents acquired last year through the purchase of Steel & Tubes Inc. The first unit, to make pipe from 3 to 7 inches in diameter, is expected to be ready in sixty days. The other units will make pipe from 7 to 14 inches, and over 14 inches.

Electrification of many of the mills in the Youngstown district will be possible by utilizing waste gases from the Haselton blast furnace. It is expected that the expansion work will cost $10,000,000.

The financial statement of the Republic company shows earnings in the first quarter at the rate of $3.04 per share, or better than $12 a year. In all of 1928 the company earned $4.19 per share. The net income of the company after maintenance, repairs and federal taxes, was $4,107,575. Unfilled orders as of March 31 totaled 425,569 tons, compared with 405,929 tons last Dec. 31.

Inland Income Gains

First quarter earnings of Inland Steel Co., Chicago, exceeded those for the corresponding period of 1928, according to L. E. Block, chairman of the board. In the first quarter of 1928 the company reported net income, after all charges, excepting employes' pension fund, of $2,291,442. These earnings were equivalent to $1.79 a share on 1,182,799 shares of common stock then outstanding.

Billings Make Big Gain

Sales billed in the first quarter of 1929 by the General Electric Co., Schenectady, N. Y., amounted to $83,385,015, compared with $71,640,790, an increase of 16 per cent. Profit available for dividends on common stock for the first quarter was $13,862,298, compared with $11,261,842 in the corresponding quarter of 1928.

Barrel Output Increases in March

Washington, April 30. — Twenty-seven companies operating 31 plants in March made 742,165 barrels, compared with 567,398 in February and 636,855 last March, states the department of commerce. In March 61 per cent of capacity was engaged, against 47.6 in February and 55.1 last March. The department of commerce comparison follows:

1928	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
Mar.	636,855	644,521	304,043	1,039,540
Tot., 3 mo.	1,631,705	1,633,042	.....	.....
Apr.	667,827	661,949	357,131	919,863
May	696,281	694,843	324,549	932,568
June	712,779	717,496	319,443	840,313
July	647,844	645,881	341,346	891,066
Aug.	677,313	675,600	319,495	744,863
Sept.	593,255	595,640	292,686	704,134
Oct.	656,021	661,009	301,782	522,090
Nov.	563,647	568,353	322,135	634,982
Dec.	551,113	549,913	246,460	1,110,983
Total (year)	7,397,784	7,403,726	.....	.....
1929				
Jan.	558,492	548,581	319,704	1,342,006
Feb.	567,398	563,532	345,365	1,198,481
Mar.	742,165	743,407	393,941	1,076,317
Tot., 3 mo.	1,868,055	1,855,520	.....	.....

In March 521,096 I.C.C. barrels were shipped, compared with 372,528 in February, states the Steel Barrel Manufacturers institute, Cleveland. The total number of barrels on unfilled orders April 1 was 467,593, against 493,290 one month previous. Production in the month engaged 52.3 per cent of capacity, compared with 46.5 per cent in February. March business, as reported by the institute, totaled $1,279,212.78.

Gray Iron Foundries Better in March

Cleveland, April 30.—Production of gray iron castings by 98 representative foundries reporting to the Gray Iron Institute Inc., Cleveland, in March was 135.4 per cent of normal, or the average monthly output of the last three calendar years. Ninety foundries, reporting on the business outlook, divided as follows: 50 good, 37 fair and 3 poor. Following is a comparison, which reveals marked gains over February:

	No. of Foundries Reporting	Short tons	Per cent of Normal*
Normal production	98	21,840	100.0
Production, Mar., 1929	98	29,584	135.4
New orders, rec'd., Mar.	60	16,667	135.5
Unfilled orders, Mar. 31	53	13,440	118.1
Materials rec'd. Mar†	85	28,679	140.8
Mat'ls on hand, Mar. 31†	84	34,564	175.0

*Normal production is the average monthly production in 1926, 1927 and 1928. The percentages are in ratio to the total normal production for the number of foundries shown.

†All grades of pig iron and all grades of scrap.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

KOPPERS CONSTRUCTION CO., Pittsburgh, has been awarded the contract for the installation of 25 new coke ovens by the Providence Gas Co., Providence, R. I., doubling present coal gas manufacturing capacity. The Providence company will also construct 23 miles of additional pipe line extension, involving 6 and 8-inch pipe material.

* * *

AMERICAN BRASS CO., Waterbury, Conn., has purchased the French Mfg. Co., maker of small brass and copper tubing.

* * *

EAGLE LAUNDRY MACHINERY CO., St. Louis, has moved its plant to 111 South Second street. The company was formerly known as the Eagle Mfg. Co.

* * *

TRAV-LER MFG. CORP., St. Louis, manufacturer of portable radio equipment, has moved its plant from Chicago to 1818 Washington avenue. Harold J. Wray is president.

* * *

LUTHER GRINDER MFG. CO., 285 South Water street, Milwaukee, now also manufacturing vibrators and other exercising machines, has changed its corporate style to Luther Inc.

* * *

GISHOLT MACHINE CO., Madison, Wis., manufacturer of machine tools, has established a district sales office in St. Louis, in charge of T. G. Lamanna, sales engineer.

* * *

UNIVERSAL TOOL & DIE CO., 128 Ferry street, Milwaukee, has been incorporated by its owners under same style. Principals are Val Koller and Louis Medved.

* * *

HALPIN-KAHLBRY, INC., St. Louis, distributor of tool steel and machinery, has moved to its new office and warehouse building at 4116 Clayton avenue.

* * *

GENFIRE STEEL CO., Youngstown, O., has entered the steel deck roofing field with G. L. Rees manager of the new department. The new design is built from 6-inch widths interlocking on each side. It presents a smooth surface for insulating materials and is erected without perforation of the steel members.

* * *

BATES TRACTOR CO., Lansing, Mich., has changed its name to Bates Wohlert Co. The company is composed of Ralph E. Bates and Fred Wohlert Jr. No change will be made in personnel or policies.

* * *

EDWARD VALVE & MFG. CO., East Chicago, Ind., manufacturer of power plant and refinery valves, has appointed D. C. Elphinstone Inc., 120 South Calvert street, Baltimore, its representative in that district.

* * *

AMERICAN SMELTING CO. has resumed operations at Monterrey, Mexico, after suspension of three weeks due to activities of rebels. Impaired railroad service cut off supplies of metal and fuel.

* * *

BUFFALO LAMP CO. and Bensman Mfg. Co., Buffalo, have merged under the name of the Buffalo Lamp & Mfg. Co. The company will produce a line of spun and stamped metal articles.

* * *

WEED & CO., Buffalo, whose warehouse recently was damaged by fire, has leased a building at Swan and Center streets and will use it until the present building can be reconstructed.

* * *

A B. T. MFG. CO., 2512 West Monroe street, Chicago, manufacturer of coin vending machines, has purchased a one-story factory building and lot at 1311-19 Carroll street, Chicago. The company is establishing its plant in the new building.

* * *

HOOVER CO., Hoover & Mason Phosphate Co., Ruhm Phosphate & Chemical Co., Hoover & Mason, and associated companies, have removed their Chicago offices from 1407 Railway Exchange building to 2300 Willoughby tower, 8 South Michigan boulevard.

* * *

AMERICAN STEEL FOUNDRIES has reopened its plant at Verona, Pa., where the production of railway specialty castings has been resumed after the plant had been shut down more than a year. Some equipment will be purchased later and other improvements made.

* * *

H KRAMER & CO., West Twenty-first and Loomis streets, Chicago, smelters and refiners of nonferrous metals, have purchased a plant building from Benjamin Harris & Co., adjoining. The purchase increases the Kramer holdings to one block. It is stated the Kramer company will make some plant improvements.

* * *

BRADSHAW & CO., 530 Fourth avenue, Pittsburgh, have been appointed exclusive agents in Pittsburgh and Cleveland territory for Leeds & Northrup metered combustion control equipment. The territory includes western Pennsylvania, eastern Ohio, western New York and all of West Virginia.

* * *

ANACONDA WIRE & CABLE CO. of Delaware has acquired the Tubular Woven Fabric Co., Pawtucket, R. I., the former company being a subsidiary of the Anaconda Copper Co. Its products in Rhode Island will include metal wire cable, insulating materials and machinery. William E. Sprackling, president of the Tubular company, is resident agent.

* * *

NICHOLSON UNIVERSAL STEAMSHIP CO., Detroit, plans a terminal at Buffalo similar to that recently erected in Cleveland. The new terminal will be used to receive and store automobiles brought from Detroit and other lake ports west of Buffalo. It will be able to handle 35,000 automobiles annually, it is estimated. The terminal will be ready when the 1930 navigation season opens on the Great Lakes.

* * *

HAMILTON AERO MFG. CO., Milwaukee, which recently announced that it would double its output, is preparing for another 100 per cent increase. The concern recently acquired a building of 68,000 square feet at Bremen street and Concordia avenue, Milwaukee, and is installing equipment. It has now been decided

to purchase an equal quantity of equipment, and use the entire space available. The Hamilton company was acquired some months ago by the United Aircraft & Transport Corp., which also took over the Hamilton Metalplane Co., Milwaukee, a separate corporation building complete all metal ships.

* * *

CONTINENTAL CAN CO. has bought the McDonald Machine Co., Chicago, manufacturer of can-making machinery.

* * *

WEIRTON STEEL CO. has moved its Philadelphia branch office into larger quarters in the Packard building. L. P. Lane is district sales manager.

* * *

STANDARD INSPECTION CO., Pittsburgh, has moved its offices and testing rooms to the Martin building, 119 Federal street, from the Jones Law building, 311 Ross street.

* * *

LOUIS H. ROTHSCHILD, dealer in iron and steel products, Oliver building, Pittsburgh, for the past 12 years, has moved to 1108 May building, Fifth and Liberty avenues.

* * *

CHANCE CO., Centralia, Mo., manufacturer of automobile and electrical specialties, suffered fire damage to its warehouse recently and has let a contract to the Truscon Steel Co. for immediate rebuilding.

* * *

ATLAS MFG. CO., Fostoria, O., has been absorbed by the Hupp Motor Corp. It was a subsidiary of the Chandler Motor Car Co., Cleveland, and manufactured parts for Chandler cars.

* * *

STEWART BOLLING CO., Cleveland, dealer in used machinery, has taken over the warehouse of the Midvale Iron Co., 5125 Lakeside avenue, as an addition to its warehouse and storage facilities.

* * *

CENTRAL ALLOY STEEL CORP., Canton, O., is building a large nitriding furnace to produce nitralloy, a stainless steel, manufacturing rights on which were obtained recently from Krupps, in Germany.

* * *

MASSEY-HARRIS CO., of Toronto, Ont., which last year took over the J. I. Case Plow Works Co., Racine, Wis., has leased 10,000 square feet in a building at Milwaukee. Parts will be shipped from the Canadian factory to be assembled in Milwaukee and forwarded to distributors. This means is being taken to relieve the pressure upon the large works in Racine during the period of peak demand for farm machinery.

* * *

PORTERSVILLE FOUNDRY, Portersville, Calif., is building an addition to its plant. The company manufactures various types of pumps and does jobbing work in iron, brass and aluminum. C. C. Rumble is proprietor.

* * *

PACIFIC GAS RADIATOR CO., 7541 Roseberry street, Huntington Park, Calif., recently has increased its melting capacity by the installation of a 66-inch shell cupola, a No. 5 blower, a steel charging platform and an electric elevator.

* * *

HALEY BRASS FOUNDRY CO. has been formed by Robert Haley, for some time a partner in the Master Carburetor Co., Los Angeles. He has leased a foundry at 2369 East Fifty-first street, formerly occupied by the Earle Hardware Mfg. Co.

* * *

MAJESTIC TOOL & MFG. CO., 2650 Poplar street, Detroit, recently incorporated, has started production of tools and dies and expects to begin production of high-speed ball bearings soon. John W. Parker and Richard A. Hoelzel are officers.

* * *

CONVEYOR CO., Los Angeles, has purchased a six-acre site on East Slauson avenue, Los Angeles, and will erect buildings for its various operations. It is probable that a foundry will be included in the expansion program.

* * *

ATLAS IRON WORKS INC., Los Angeles, which operates a gray iron and semi-steel foundry at East Sixty-first street and Eastern avenue, is building a machine shop as the second unit. Earle V. Grover is president and D. L. Swinnerton is secretary.

* * *

APOLLO STEEL CO., Apollo, Pa., has opened two new sales offices. The company now is represented at Nashville, Tenn., by Cavort & Lipscomb, Nashville Trust building. A new office at 846 Illlinois building, Indianapolis, is in charge of P. P. Barrett.

* * *

ART METAL WORKS INC., New York, has formed a British subsidiary, the Ronson Art Metal Co. Ltd., to carry on the company's operations in Europe and the British dominions. A plant will be established in London. Half the stock of the new company will be owned by the parent American company and half by the Cadogan Co., of England, a trading company.

* * *

JONES & LAUGHLIN STEEL CORP. has removed its Detroit headquarters from 837 Penobscot building to 2111 Fisher building, Grand boulevard and Second avenue. Frank D. Heath continues in charge.

* * *

BORG-WARNER CORP., Chicago, manufacturer of automobile parts, has completed negotiations for acquisition of the Morse Chain Co., Ithaca, N. Y., by exchange of stock. The latter manufactures timing chains and sprockets for automobiles, power transmission chains and gearing for industrial purposes. It has a subsidiary in England and controls the Ithaca Street Railway Co., which has valuable hydraulic power.

* * *

SHARON TUBE CO., Sharon, Pa., has been formed to manufacture small tubing for airplane construction. The company is headed by Isaac Levine, New York. The company has bought four acres from the Shenango Machine Co., Sharon, improved with five buildings. The company will manufacture steel steering columns for automobiles and airplanes, electric wiring conduits, welded pipe and various types of tubing. H. D. Scott, Wheeling, W. Va., is vice president and Harry Forker, Sharon, Pa., is secretary.

* * *

PITTSBURGH STEEL CO. has plans under way for the erection of by-product coke ovens at a site between Monessen and Gibsonton, Pa. Orders for the equipment have not been placed and it will be some time before actual construction is under way. It is planned to relocate tracks of the Pittsburgh & Lake Erie railroad at Gibsonton to make room for the new plant. The Pittsburgh Steel Co.'s main works is located at Monessen, including two blast furnaces. The stacks have been operated on Connellsville coke in the past.

* * *

OIL WELL SUPPLY CO., Pittsburgh, has obtained control of the Wilson-Snyder Mfg. Co., Braddock, Pa., manufacturer of pumps used largely in oil fields, refineries and in cracking plants. The merger becomes effective May 1. Business of each company will be operated as a separate unit. Benjamin F. Harris, vice president and general manager of Wilson-Snyder, will succeed Walter C. Carroll in the presidency of Oil Well Supply, the latter becoming chairman of the board. E. W. Criswell will become secretary and H. H. James will become treasurer of Wilson-Snyder.

Mechanical Engineers To Meet in Rochester

Preparations have been made by the American Society of Mechanical Engineers to meet in Rochester, N. Y. May 13-16. The program covers a variety of subjects including materials handling, aeronautics and management, heat transmission, applied mechanics, education, and boiler furnace refractories. Convention headquarters will be at Sagamore hotel.

Papers have been announced as follows:

"Machine for Making Creep Tests at High Temperatures," by G. D. Bagley
"Controlling the Manufacture of parts on Order and for Stock by the Gantt Progress Chart," David B. Porter
"Synchronization of Sales and Production," by Howard M. Hubbard
"New Type of Air Spring," by J. K. Wood
"Some Factors in Removal of Ash as Molton Slag from Powdered-Coal Furnaces," by Ralph A. Sherman, P. Nicholls and Edmund Taylor
"Present Status of Tests for Refractories," S. M. Phelps and J. S. McDowell
"Design and Proportion of Economizers and Air Preheaters," by Hosea Webster
"Handling Papers and Small Articles by Pneumatic Tubes," by James Whiting
"Diamonds as Metal-Cutting Tools," by Carl L. Bausch
"Large Spiral Bevel and Hypoid Gears," Allan H. Candee
"Progress Report on Thread Form of Milled Worms," by Earle Buckingham
"Heat Installation Practice in the Modern Steam Generating Plant," by L. B. McMillan
"Proprietary Air-Cooled Refractory Walls," Charles S. Gladden
"British Apprenticeship Report and Its Value to American Industry," by William S. Conant
"Calculations of Flywheels for Air Compressors," H. R. Goss and H. V. Putman
"Formation and Heat Transfer Effects of Calcium Sulphate Boiler Scale," by E. P. Partridge and A. H. White
"Investigations on Tungsten Carbide Cutting Alloys," by W. Paul Eddy Jr.
"Economies Which May Be Effected in Power Transmission," by W. W. Nichols
"Control of Boiler Water Treatment to Prevent Embrittlement," by Frederick G. Straub.
"Surface Transmission," by R. H. Heilman
"A Laboratory Slagging Test for Boiler Furnace Refractories," by R. K. Hursh
"A Study of Crystaline Compounds Formed in Slags and Boiler Furnace Refractories," by T. A. Klinefelter and E. P. Rexford
"Evolution of Slag Tap Furnace at the Chas. R. Huntley Station, Buffalo, N. Y.," by H. M. Cushing
"The Technical Institute, European Examples and Their Significance to American Education," by William E. Wickenden
"Industry Specifies Its School Training Needs," by Virgil M. Palmer
"Selective Package Conveyors," by W. O. Hildreth

To Visit United States Enroute to Congress

Arrangements are being made to receive 100 European engineers and scientists, who will arrive in New York during the summer enroute to the World Engineering congress at Tokio, Japan. It is expected that the foreign engineers will arrive in separate delegations of approximately 40 each from Great Britain and Germany and the remainder from Sweden, Denmark, France and Italy, probably during August and September.

The reception committee is composed of New York engineers headed by Roy V. Wright, president of the United Engineering societies. Maurice Holland is executive secretary of the American committee of the congress and Dr. Elmer A. Sperry chairman.

The foreign delegations will sail from the Pacific coast for Japan about the time the American delegation, which now is composed of 235 engineers and their families from all parts of the country, sail from San Francisco on Oct. 11.

March Coke Production in Good Gain

Output of by-product coke in March was 4,613,075 net tons and of beehive coke 533,500 tons, a total of 5,146,575 tons, states the federal bureau of mines, Washington. This compares with 4,089,710 tons of by-product and 440,200 beehive coke in February and 4,064,940 tons of by-product and 449,400 tons of beehive coke in March, 1928.

Of the by-product output in March, 78.4 per cent was made by plants attached to blast furnaces. In March by-product plants consumed 6,656,000 tons of coal and beehive plants 830,000 tons. As of April 1, stocks of by-product coke at furnace plants totaled 652,378 tons and of other plants 560,184 tons, or a total of 1,212,562. A year ago stocks of by-product coke were 748,460 tons at furnace plants and 955,121 tons at other plants, or a total of 1,702,581 tons.

Convention Calendar

May 1-2—Taylor society. Spring meeting at Hotel Selwyn, Charlotte, N. C. H. S. Person, 29 West Thirty-ninth street, is managing director.

May 1-3—American Society of Mechanical Engineers. National management and materials handling meeting at Book-Cadillac hotel, Detroit. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

May 6-10—American Management association. Annual spring convention at Hotel Pennsylvania, New York. W. J. Donald, 20 Vesey street, New York, is managing director.

May 7-9—American Supply and Machinery Manufacturers' association. Annual convention at Ambassador hotel, Atlantic City, N. J. R. Kennedy Hanson, 717 Clark building, Pittsburgh, is secretary.

May 7-9—National Supply and Machinery Distributors' association. Annual convention at Ambassador hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

May 7-9—Southern Supply and Machinery Dealers' association. Annual convention at Ambassador hotel, Atlantic City, N .J. Alvin M. Smith, Smith-Courtney Co., Richmond, Va., is secretary.

May 13-16—American Society of Mechanical Engineers. Spring meeting at Sagamore hotel, Rochester, N. Y. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

May 16-17—National Hardware Association of the United States. Eighteenth annual meeting of metal branch at Hotel Statler, Detroit. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

May 16-18—American Gear Manufacturers' association. Annual meeting at Hotel Statler, Cleveland. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

May 21-22—American Refractories institute. Annual meeting at French Lick Springs hotel, French Lick, Ind. Dorothy A. Texter, 2202 Oliver building, Pittsburgh, is secretary.

May 21-23—American Steel and Heavy Hardware association. Twentieth annual convention at Hotel Washington, Washington. B. R. Sackett, 503 Arch street, Philadelphia, is secretary.

May 24—American Iron and Steel institute. Annual spring meeting at Hotel Commodore, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

May 27-28—Associated Machine Tool Dealers. Annual spring meeting at Granville Inn, Granville, O. E. P. Essley, 551 West Washington boulevard, Chicago, is secretary.

May 27-29—American Electrochemical society. Spring meeting at University of Toronto, Toronto, Ont. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Detroit Founders Elect

Detroit Foundrymen's association has elected Russell M. Scott, foundry manager, Packard Motor Co., president. Other officers elected were: Vice president, James L. Mahon, American Car & Foundry Co.; secretary, William J. Muhlitner, Great Lakes Foundry Sand Co.; treasurer, Fred A. Cowan, W. R. Thompson Co. Members of the executive board are: Peter W. Mulder, Almont Mfg. Co.; George L. Grimes, Grimes Molding Machine Co.; Fred J. Walls, Wilson Foundry & Machine Co.; Harry Rayner, Dodge Bros.; J. J. Boland, Griffin Wheel Co.

The annual banquet of the association will be held May 7, at the Fort Shelby hotel. Robert Crawford, Atlas Foundry Co., will be toastmaster. Judge Arthur Kilpatrick, in his youth a foundryman, will talk on his foundry experiences.

Acme Steel Net Grows

Acme Steel Co.'s first quarter was the best three-month period in the history of the company, according to an official statement. Net earnings for the 1929 period totaled $788,034, equal to $2.87 a share on the present capitalization, compared with $460,576, or $1.67 a share on the same basis for the first quarter of last year. Earnings this year represented an increase of 71.1 per cent. The company's automobile parts and box strapping business is running at a record rate. The plants have sufficicient orders booked to cover operations for all of the second and third quarters, it is stated.

The South Manchurian railroad, owned by the Japanese, is reported planning a steelworks at Anshan, Manchuria.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

East Central

BROADVIEW, ILL.—Economy Scaffold Co., 4619 Fulton street, Chicago, W. W. Horn president, plans a 2-story plant here.

CHICAGO—Olive Can Co., 450 North Leavitt street, will soon award contract for 1-story plant addition, 45 x 118 feet.

CHICAGO—Standard Stamping & Perforating Co., 4718 Fifth avenue, is planning to build 1-story and basement plant. A. Epstein, 2001 Pershing road, is architect.

CHICAGO—Carter Inc., 407 South Aberdeen street, recently incorporated subsidiary of Carter Radio Co., A. J. Carter president, advises it will manufacture and sell therapeutic devices, office devices, and electrical specialties.

CHICAGO—A new airport, to be known as Curtiss field, will be built on a tract of 430 acres northwest of Chicago, according to Maj. R. W. Schroeder, vice president and general manager of Curtiss Flying Service. Accommodations will be provided for flying schools, hangars, dormitories and repair shops will be built.

LIBERTYVILLE, ILL.—Abbott Laboratories Inc., North Chicago, Ill., manufacturer of fine chemicals, is considering plans for construction of plant here. Estimated cost is $100,000, including equipment.

ROCKFORD, ILL.—Rockford Drop Forge Co., Ninth street, plans a 1-story addition to boiler plant 60 x 72 feet.

ALEXANDRIA, IND.—Aladdin Industries Inc., 601 West Lake street, Chicago, plans construction of new plant addition, 90 x 509 feet, as second part of expansion program here. Machine shop is under construction.

FT. WAYNE, IND.—Steinite Radio Co., Ft. Wayne, awarded contract for a 4-story, 202 x 500-foot building, including 200 x 500-foot machine shop, 45 x 50-foot boiler house, to Buesching & Hagerman, 492 East Superior street, Ft. Wayne. (Noted Feb. 28.)

HAMMOND, IND.—Lever Bros. Co., 146 Broadway, Cambridge, Mass., plans to install power equipment in proposed new soap manufacturing plant here. A new boiler room is also contemplated.

LA PORTE, IND.—Absolute Con-Tac-Tor Co., care Alex Jager, vice president, 659 Spring avenue, has awarded contract for 1-story and basement plant addition, to H. G. Christman, 306 South Notre Dame avenue, South Bend, Ind. Work has started.

MICHIGAN CITY, IND.—Contracts will be awarded May 7 for the construction of the first unit of the new plant for the C. A. Dunham Co., manufacturer of differential vacuum heating apparatus, and heating engineers. This unit with equipment will cost about $1,000,000. Frank D. Chase Inc., 720 North Michigan boulevard, Chicago, is taking bids.

DETROIT—Bohn Aluminum & Brass Corp. has started work on its addition, at plant No. 5, 7880 Jos. Campeau avenue, according to Charles B. Bohn, president. New machinery will cost $100,000. (Noted April 18.)

ST. CLAIR, MICH.—Buhl Aircraft Co., Marysville, Mich., is planning to build hangars, administration building, and assembly plant. Estimated cost $500,000.

ST. JOSEPH, MICH.—St. Joseph Iron Works, recently merged with the Stapling Machine Co., Rockaway, N. J., will expand its plant here to make room for additional machinery, according to W. E. Hatch, secretary and treasurer of the St. Joseph company.

ASHTABULA HARBOR, O.—Cleveland Electric Illuminating Co., Cleveland, announced that construction of a $11,000,000 generating plant would be started here immediately. The new unit will have a capacity of 150,000 kilowatts.

Resale News

ASSETS of Attendu Engines Ltd., Montreal, Que., which is in liquidation, will be sold at auction. The holdings of the company include three United States and one Canadian patents of A. C. Attendu, with corresponding foreign patents covering diesel and other heavy oil engines.

* * *

Art Bronze Inc., Montreal, Que., has gone into liquidaton in accordance with the decision of a meeting of the shareholders held April 13 and George Duclos has been appointed provisional liquidator.

Sales Calendar

May 2—Auction of metals and other navy surplus at navy yard, Norfolk, Va.

May 6—Sale at auction at Racine, Wis., of property of H. & M. Body Corp.

AKRON, O.—Goodyear Zeppelin Corp. has awarded contract for the manufacture of the door operating mechanism, with the supporting trucks and hinges, including supplying the electrical equipment for its airship plant to the Wellman-Seaver-Morgan Co., Cleveland.

CANTON, O.—International Steel Corp., a Delaware company, has leased the plant of the former Canton Steel Foundry Co. and will probably start remodeling the plant at once, at a cost of about $400,000. The company will manufacture steel castings under a special process. S. W. Harley, Chicago, is president.

CLEVELAND—Cleveland Trencher Co., 20100 St. Clair avenue, has awarded contract for construction of plant addition to the Austin Co., 16112 Euclid avenue.

CLEVELAND—Motor Pattern Co., 6105 Waterman avenue, has awarded contract for construction of 1-story plant addition, 41 x 116 feet, to C. W. Webster, 9507 Easton avenue, Cleveland. J. S. Parker is treasurer.

CLEVELAND—Cleveland Dental Mfg. Co., W. L. Truesdell, president, 3307 Scranton road, Cleveland, awarded contract for 3-story plant addition to W. J. Schirmer Co., 1720 Euclid avenue.

CLEVELAND—Eaton Axle & Spring Co., East Sixty-fifth and Central avenue, has awarded contract to the Sam W. Emerson Co. for the construction of a service building, 113 x 163 feet, at Detroit avenue and West Thirty-third street.

MASSILLON, O.—Massillon Rivet & Mfg. Co. plans construction of a 1-story plant addition, 38 x 100 feet, on Erie street, South.

NILES, O.—Sykes Metal Lath Co. is building a plant addition.

TOLEDO, O.—Surface Combustion Co., 2375 Dorr, street, Toledo, awarded contract for a 1-story plant addition, 170 x 180 feet, to A. Bentley & Sons, Belmont street, Toledo.

CHARLESTON, W. VA.—United Supply Co., recently incorporated to manufacture oil and gas well tools, advises it will build a blacksmith and machine shop plant. Equipment will be purchased. (Noted April 25.)

EAU CLAIRE, WIS.—The White Machine Co., 427 Water street, has let contracts for the erection of a shop addition, 30 x 48 x 50 feet, to cost about $30,000 with equipment.

LA CROSSE, WIS.—The common council has approved of a bond issue of $50,000 for enlargement of the present vocational training school. Several architects are submitting sketches. G. M. Wiley is secretary of the vocational board.

MANITOWOC, WIS.—Aluminum Goods Mfg. Co., manufacturer of kitchen utensils, etc., which recently purchased the Manitowoc Plating Works, has broken ground for a five-story addition, 150 x 200 feet, to that department.

Other new construction at the main works in Manitowoc and the branch plant at Two Rivers is expected to aggregate upward of $1,250,000 during 1929. (Noted March 21.)

MILWAUKEE—Generating Gear Co., 1244 Twenty-third avenue, has let contracts for the erection of a gear works extension, 60 x 130 feet, at the rear of the present plant, extending it to 1245 Twenty-fourth avenue.

MILWAUKEE—Work is being started by the Wesley Steel Treating Co., 651 South Pierce street, on a new transformer room and substation, 30 x 50 feet and 21 feet high, in connection with a plant enlargement to double the present capacity.

North Atlantic

ATTLEBORO, MASS.—Massberg Pressed Steel Co., 81 West street, care F. Massberg, plans 1-story and basement plant, 100 x 300 feet.

BOSTON—Royal Appliances Corp., 120 Harrison avenue, recently incorporated to manufacture electric motors, and electric machinery and equipment, advises it has plans under consideration for building a plant. (Noted April 25.)

LYNN, MASS.—North Shore Cutting & Die Co., 266 Broad street, has awarded contract for construction of 1-story plant to J. Grosky. (Noted Feb. 28.)

SOMERVILLE, MASS.—Whitney Barrel Co., J. Whitney, president, 117 Linwood street, has awarded contract for 1-story plant addition, 75 x 130 feet.

WALTHAM, MASS.—J. L. Thompson Mfg. Co., manufacturer of hardware specialties, awarded contract for construction of 1-story plant addition to W. M. Bailey Co., 88 Broad street, Boston.

WESTBORO, MASS.—Bay State Abrasive Products Co. plans the construction of a plant.

LACONIA, N. H.—Scott & Williams Inc., 299 Union avenue, manufacturer of knitting machinery, has awarded contract for a 4-story addition 60 x 180 feet, including a boiler plant, to Temple & Crane Inc., 99 Chauncy street, Boston.

PERTH AMBOY, N. J.—Raritan Copper Works proposes to build three 1-story additions.

BROOKLYN, N. Y.—Victor Metal Products Corp., 196 Diamond street, M. Prusing in charge, is taking bids on general contract for rebuilding plant, recently damaged by fire. Albert Kunzi, 788 Manhattan avenue, is architect.

LOCKPORT, N. Y.—Directors of the Multicell Radiator Corp. have decided to build a plant here. New type radiators and boilers will be manufactured. Frank A. Abbott, Buffalo, is secretary and treasurer, and is in charge of plans for the new building.

LONG ISLAND CITY, N. Y.—Anchor Cap & Closure Corp. is planning to construct a 6-story plant. Plans by Stone & Webster Engineering Co., 30 Dutch Kills street.

LONG ISLAND CITY, N. Y.—Allied Die Casting Corp. has laid the foundation for its new plant, at Forty-third avenue and Thirty-eighth to Thirty-ninth streets, Long Island City. (Noted March 21.)

NEW YORK—New York Air Terminals Inc., 25 Broad street, F. B. Maltby chief engineer, advises it has awarded the contract for steel work for a hangar 120 x 120 feet, to Virginia Bridge & Iron Works.

NIAGARA FALLS, N. Y.—Niacet Chemical Co. has announced plans for additions to its offices, machine shop, and garage buildings here. Laur & Mack, Niagara Falls, are general contractors.

BRADDOCK, PA.—Wilson Snyder Mfg. Co. plans a 1-story machine shop addition, 60 x 127 feet.

PHILADELPHIA—Brown Instrument Co., Roberts and Wayne streets, will soon let contract for 2-story and basement plant, 79 x 219 feet. Ballinger Co., Twelfth and Chestnut streets, is architect.

PHILADELPHIA—Children's Hospital, Eighteenth and Bainbridge streets, plans construction of hospital buildings, including power house. Stewardson & Page, 315 South Fifteenth street, are architects.

PITTSBURGH—Miller Saw Trimmer Co., Point boulevard, will soon let contract for construction of 1 and 2-story plant additions, 84 x 157 feet.

PITTSBURGH, PA.—Heppenstall Forge & Knife Co., 4620 Hatfield street, awarded contract for a 1-story 60 x 71 feet annealing building to Rust Engineering Co., American State Bank building, Pittsburgh.

SHARON, PA.—Sharon Tube Co., recently incorporated to manufacture automobile and airplane parts, welded pipe and electrical fixtures, has purchased land and five buildings, from the Shenango Machine Co., Sharon, Pa. Harry Forker, Sharon is secretary.

VERONA, PA.—American Steel Foundries, 410 North Michigan boulevard, Chicago, has reopened its plant here, where the production of railway specialty castings has been resumed. Some equipment will be purchased later and other improvements made.

West Central

SANDPOINT, IDAHO—City voted $300,000 bond issue for construction of municipal power plant on Priest river. (Noted March 21.)

SIOUX CITY, IOWA—Sisters of St. Francis, Dubuque, plan construction of college buildings, including power plant. Steele & Hilgers, Sioux City, are architects.

WICHITA, KANS.—Coleman Lamp Co., 258 North St. Francis street, has awarded contract for the construction of a 4-story plant and office building with basement, 61 x 160 feet, to J. Denny, 1451 North Lawrence street.

KANSAS CITY, MO.—Blue Valley Foundry Co., 7019 Twelfth street, plans to build a 1-story addition, 50 x 70 feet.

POPLAR BLUFF, MO.—This city, J. W. Berryman mayor, is contemplating construction of water purification plant and water tower. W. A. Fuller Co., 2916 Shenandoah street, St. Louis, consulting engineer.

ST. LOUIS—Von Hoffman Aircraft Co., Distributor for the Eaglerock Co., Colorado Springs, Colo., will build an assembly plant at Lambert-St. Louis Flying field, according to Albert Von Hoffman, president.

ST. LOUIS—The Union Electric Light & Power Co., Twelfth and Locust streets, announces that it will build a $30,000,000 power plant with initial capacity of 160,000 horsepower on the Osage river near Bagnell, Mo., about 150 miles from St. Louis.

FARGO, N. DAK.—Otter Tail Power Co. has awarded contract to Siems, Helmer & Schaffner, Minneapolis, for addition to plant here. (Noted March 14.)

Southern States

BIRMINGHAM, ALA.—Grasselli Chemical Co., B-M building, Birmingham, plans to rebuild plant recently destroyed by fire.

SYLACAUGA, ALA.—A local stock company has organized to build and operate a casket plant here. The matter of electing officers, selecting location of the plant, etc., will be done immediately and work will begin on the buildings as soon as possible. Chamber of commerce is fostering movement.

TARRANT CITY, ALA.—Southern Cereal Co. plans to install power equipment in new

cereal plant here.

CLEWISTON, FLA.—Southern Sugar Co. will install power equipment in connection with improvements to cane sugar mill here.

NEW ORLEANS—O. M. Gwin Construction Co., Union Indemnity building, has been awarded contract for construction of a concrete and steel powerhouse building for Charity hospital.

MIAMI, OKLA.—New Chicago Mines Corp., E. H. Wolff, Joplin, Mo., president, has purchased the Lanyon Zinc Co. smelter at Van Buren, Ark., and will improve the property, including installation of a sintering plant.

OKLAHOMA CITY, OKLA.—Capitol Steel & Iron Co., which recently purchased the Oklahoma Structural Steel Co., is planning an expansion program. First unit to be built will be a 75-foot unloading runway. The structure will be under roof and will be equipped with a 10-ton overhead traveling crane. W. A. Jennings is in charge of drafting plans for the new plant.

SAND SPRINGS, OKLA.—Wackman Welded Ware Co., 2412 South Seventh street, St. Louis, has awarded contract to J. R. Forner Construction Co., Ritz building, Tulsa, Okla., for plant to manufacture steel barrels. (Noted April 4.)

WETUMKA, OKLA.—Central Tool Co., Paul Sticklebar manager, has increased capital from $50,000 to $150,000 to provide for improvements. Company manufactures oil field tools.

ROCK HILL, S. C.—A. H. Guion & Co., West Main street, Gastonia, N. C., is reported low bidder for construction of filtration plant, water mains, pump house, etc. Robert & Co. Inc., Bona Allen building, Atlanta, Ga., are engineers.

DENISON, TEX.—W. J. Smith Wood Preserving Co. plans to build plant. Estimated cost $75,000, including full equipment in machinery.

ODESSA, TEX.—Texas Electric Service Co., Odessa, subsidiary of Electric Bond & Share Co., 2 Rector street, New York, plans to rebuild part of electric plant recently damaged by fire, including some equipment.

FRUITVALE, CALIF.—United Filters Co., Hazelton, Pa., plans to install power equipment in proposed new filter machinery manufacturing plant here. A boiler room is also contemplated.

LOS ANGELES—Atlas Iron Works Inc., East Sixty-first street and Eastern avenue, which operates a gray iron and semisteel foundry, is building a machine shop addition. Earle V. Grover is president.

LOS ANGELES—Conveyor Co., 129 Llewellyn street, has purchased a six-acre site on East Slauson avenue, where it will erect buildings for its various operations. It is probable that a foundry will be included in the expansion program.

PORTERVILLE, CALIF.—Porterville Foundry is building an addition to its plant.

RIVERSIDE, CALIF.—Southern Sierras Power Co. has awarded contract for construction of power plant, transformer room, etc., on North Main street, to W. J. Nethery & Son.

SAN FRANCISCO—Michel & Pfeffer Iron Works, Tenth and Harrison streets, is planning first unit of plant to include bronze foundry, etc.

SAN PEDRO, CALIF.—Regan Forge & Engineering Co., Smith's Island, San Pedro, Calif., plans to build plant addition.

SOUTH SAN FRANCISCO, CALIF.—Enterprise Oil Burner Co., 2902 Nineteenth street, San Francisco, plans to build a plant on Bayshore highway.

STOCKTON, CALIF.—California Water Service Co. plans to build a new pumping plant. H. K. Griffin, Stockton, is superintendent.

TORRANCE, CALIF.—Hercules Portland Cement Co., Washington and Fourth streets, Los Angeles, will soon receive bids for an 8-story plant, to include grinding mill, crushing plant, packing plant, kilns, etc. Estimated cost $2,500,000.

TORRANCE, CALIF.—Paramount Portland Cement Co., 2030 Wilshire boulevard, Los Angeles, advises it has plans for a cement plant with daily capacity of 5000 barrels, to be built here. Construction work should be under way by June 15, and plant completed within nine months.

PUEBLO, COLO.—Pueblo Lime Co., 325 East Eighth street, Jay D. Thomas manager, plans development of quarry, including installation of machinery, etc.

PORTLAND, OREG.—Proposed construction of a concrete building at Fifteenth and Marshall streets is announced by the Washington Iron Works, of Seattle, which intends to establish a branch plant and warehouse here.

CHEHALIS, WASH.—Surveying crews are on the ground of the city's proposed $1,000,000 hydroelectric project on the Nisqually river. W. J. Roberts, Tacoma, is chief engineer, and Burwall Bantz is in charge of the field work.

EVERETT, WASH.—City plans construction of a pulp and paper mill, with daily capacity of 150 tons. Estimated cost $4,500,000.

SEATTLE—Expansion of the woodwork machinery department of the Perine Machinery Co. is announced with the purchase of a half interest in the firm by W. H. Payne, who will have charge of the enlarged department.

Canada

OCEAN FALLS, B. C.—Pacific Mills Ltd. plans to construct several new buildings, including new steam turbine, and grinder room.

VANCOUVER, B. C.—Vancouver Cement Co. Ltd. plans the construction of a cement plant with 380,000 barrel capacity at Popleum, B. C.

WINNIPEG, MAN.—Canadian Pacific Railway Co. has let contract to J. H. Simmons, 506 Confederation Life building, for the erection of a sand blasting plant at its Weston shops, here.

WINNIPEG, MAN.—Bulman Bros. Ltd. have let contract to A. J. Bonnett & Bros., 408 Confederation Life building, for the erection of a $32,000 factory on Francois street. Architect is J. H. G. Russell, 110 McArthur building.

WINNIPEG, MAN.—The Vulcan Iron Works, Point Douglas, Man., has let contract to the Sutherland Construction Co. for addition to its plant to cost $150,000, and be 175 x 275 feet, 1-story, steel and concrete construction. Electric cranes and other heavy machinery will be installed in the new unit. Owners will supply structural steel.

TORONTO, ONT.—The Dominion Tar & Chemical Co., Logan avenue, will build a coke plant to cost $18,000 and has let general contract to Anglin Norcross, Ltd., 714 Temple building, and the steel contract to Reid & Brown Structural Steel & Iron Works, Fleet street, Toronto.

TORONTO, ONT.—The F. J. Hartz Co., manufacturer of surgical supplies, 24 Hayter street, has appointed a new architect, J. Francis Brown, 2 Bloor street east, to prepare plans for its $200,000 manufacturing plant on Granville street.

TORONTO, ONT.—The Toronto Iron Works, Ltd., Cherry street, has had plans prepared and will call for bids for the erection of a $500,000 plant here. Contract for excavation work has been let. (Noted April 11.)

WALKERVILLE, ONT.—Eclipse Co. is adding a plant addition covering a ground space of 100 x 300 feet. A 2-story office building is also being built. The new addition will be used for the manufacture of Bendix drives and assembling of Bendix brakes.

WINDSOR, ONT.—A number of sub-trades have been awarded in connection with the erection of a $60,000 machine and pattern shop here for the Bryant Pattern & Mfg. Works, 201 Glengarry avenue.

CARTIERVILLE, QUE.—Curtiss-Reid Aircraft Co. is building a new plant at its Cartierville airport, which is to have a capacity of 300 or 400 planes annually.

LA SALLE, QUE.—Fleischman Yeast Co. of Canada, St. Urbain street, Montreal, plans construction of a 1-story plant 80 x 80 feet, including engine room, power house and pumping station. Laurentide Construction Co. Ltd., Cement building, Montreal, is engineer. Estimated cost $500,000.

Recent Incorporations

ANNISTON, ALA.—King-Metal Products Co. has been incorporated to manufacture various kinds of steel castings.

CHICAGO.—Clear View Scales Co., 844 Rush street, has been incorporated with $5000 capital

New Construction and Enterprise

to manufacture and sell scales, scale parts, machinery, accessories, etc., by Maxwell Russell.

CHICAGO.—Filtro-Vacuo Corp., 7530 Sheridan road, has been incorporated with 100,000 shares no par value stock to manufacture and sell urns, boilers, percolators, grinders, etc., by William R. Thele.

CHICAGO.—Master Vault Release & Ventilating Co., 33 North LaSalle street, has been incorporated with $50,000 capital to manufacture and sell automatic vault locks, ventilating and safety devices, by Charles T. Myles.

CHICAGO—M. Leitner & Co., 2322 Ogden avenue, has been incorporated with $50,000 capital to manufacture and sell soda fountains, equipment and supplies, by Max Leitner, T. L. Spring, and others.

CHICAGO—Schwartz Mfg. Co., 919 South Keeler avenue, has been incorporated with $20,000 capital to manufacture and sell metal specialties, automobile equipment, hardware, etc., by Marguerite Schwartz.

CHICAGO—American Scrap & Supply Co., 1376 West Lake street, has been incorporated with $15,000 capital to deal in plumbing and heating supplies, scrap iron, metal, and machinery supplies, etc.

CHICAGO—Herman Special Mfg. Co., 32 West Randolph street, has been incorporated with $50,000 capital to manufacture and sell automotive supplies and accessories by Herman W. Freund.

CHICAGO—Nordendale Mfg. Co., 1638 North Paulina street, has been incorporated with $75,000 capital to operate a general manufacturing machine shop, die, jig, tool and other special work, by Charles E. Nordendale. Construction of plant 48 x 125 feet is planned. (Noted March 7.)

CHICAGO—Metal Weather Strip Products Co. Inc., 2612 North Sawyer street, has been incorporated with $20,000 capital to manufacture and deal in weather strips, weather proofing devices, etc. by G. C. Peters.

CHICAGO—Linick, Greene & Reed Inc., 10 South Wabash avenue, has been incorporated with $50,000 capital to manufacture and deal in tools, equipment and machinery, by L. L. Linick.

CHICAGO—Caw Regulator Co., 130 North Wells street, has been incorporated with $25,000 capital to manufacture and deal in apparatus for treating boilers, water regulators, etc., by Homer A. Dodge, Edward F. O'Toole and E. L. England.

FT. WAYNE, IND.—H. O. W. Machining Co. has been incorporated with $10,000 capital to manufacture and sell machines, tools and accessories, by Truman D. Hey, Arthur F. Wilmot and Wilbur G. Overmyer, all of Ft. Wayne.

BOSTON—Swendeman Corp. has been incorporated with $100,000 capital to manufacture and deal in machinery, tools and appliances, by Joseph E. Swendeman, 181 Huntington avenue.

BOSTON—Ayers Lyon Corp. has been incorporated with $100,000 capital to manufacture hardware, machinery, tools, electrical goods and automotive accessories. Albert B. Ayers, 20 Exeter street, West Newton, Mass., is treasurer.

BOSTON—Merrimac Oil Burning Systems Inc., 123 Merrimac street, has been incorporated with $25,000 capital to manufacture gas, oil and electric stoves, heating apparatus and other devices. Max Strauss, is treasurer.

BROOKLINE, MASS.—Fitz Crittenden Co. has been incorporated with 5000 shares no par value stock to manufacture tire chains, automobile appliances and accessories. Edward G. Fitz Henry, 13 Montvale road, Worcester, Mass., is president and treasurer.

RICHMOND, VA.—Searchlight Metals Mfg. Corp. has been incorporated to manufacture copper, lead, spelter, etc., by Louis Burnstein, 706 North Belmont avenue.

FOND DU LAC, WIS.—Ben Sadoff Iron & Metal Co. has been incorporated with $20,000 capital stock to deal in waste materials, reclaim and refine metals, etc. Incorporators are B. Sadoff, D. Menschoff and A. Sadoff. Business is already established at 24 West Cotton street.

MIMICO, ONT.—Federal Electric Appliances Ltd. has been incorporated to manufacture and deal in articles made of metal, with $10,000 capital and 12,000 shares of no par value stock by Leon M. Gouin, Rodolphe N. Senguin, and Alphonse Authier, all of Montreal.

NIAGARA FALLS, ONT.—Niagara Wire Weaving Co. Ltd. has been incorporated to manufacture and deal in wire, wire cloth, netting, etc., with 84,000 shares no par value stock by George M. Huycke, Norman Strickland, Harold C. F. Mockridge and others, all of Toronto.

OTTAWAR, ONT.—C. H. Greves Ltd. has been incorporated to manufacture and deal in electric refrigerators, and refrigerating machinery with $50,000 capital by Harold W. Watts, Harry Braham, Ferdinand E. Dewhurst, and others, all of Ottawa.

TORONTO, ONT.—Delamere Williams Grange Ltd. has been incorporated to manufacture engines and machinery with $40,000 capital by Thomas D. Delamere, George E. Hill, and John F. Woods, all of Toronto.

WINDSOR, ONT.—Industrial Equipment & Machinery Co. Ltd. has been incorporated with $40,000 capital to manufacture and deal in metals, iron and brass by Wilfred D. Roach, Adeline Wilde, of Windsor, and Ross S. Liddell of Sandwich.

New Trade Publications

SPROCKET WHEELS—Link-Belt Co., Chicago, has issued a handbook covering detailed specifications of its sprocket wheels carried in stock.

SHEET PILER—Bonnot Co., Canton, O., machinery manufacturer, has issued a bulletin on its automatic sheet piler. Illustrations show details of its construction and operation. A list of features of the device gives a basis of comparison.

ELECTRIC TRAMRAIL—Use of its tramrail devices in metal cleaning operations is described and illustrated in a bulletin by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O.

STEEL ART CASTINGS—A bulletin issued by the Kay-Brunner Steel Casting Co., Los Angeles, describes its adaptation of steel castings to the production of decorative forms formerly produced only in wrought iron. Illustrations show results of the process in producing artistic results.

DIE STEEL—Uddeholm Co. of America Inc., New York, has prepared a booklet on how to increase the life of coldheader dies by the use of its special steels for making the dies. Requirements of steel for this use is discussed and suggestions are made as to proper heat treatment.

PIPE—B. Floersheim & Co. Inc., Pittsburgh, industrial engineers specializing in piping, shows in a current bulletin some of the larger projects they have installed, in a variety of industries. Illustrations indicate the extent of the installations and a list of clients indicates the high class of service.

HANGAR DOORS—Truscon Steel Co., Youngstown, O., has published a catalog of its various types of steel hangar doors for various sizes of buildings. Specifications are presented and a list of government and private installations is included. Illustrations show a number of installations.

POWER FACTOR CORRECTION—Esterline-Angus Co., Indianapolis, discusses in a current bulletin the subject of power factor correction and the use of its graphic instruments to eliminate the evils of low power factor. Charts show what may be done to increase the power factor and thus afford economical use of power.

ELECTRIC CRANES—H. D. Conkey & Co., Mendota, Ill., manufacturer of cranes, has presented in a current bulletin its push cranes and two and three-motor electric cranes especially designed for use in ice plants, for multiple can lift. Blueprint reproductions and other illustrations supplement the text.

ELECTRICAL DEVICES—General Electric Co., Schenectady, N. Y., among recent bulletins, has presented the following: Various types of heating devices, soldering irons, glue pots, immersion heaters and similar units; centrifugal geared compressors; totally enclosed fan-cooled direct current motors; magnetic switch; vitreous enameling furnace. Illustrations and diagrams are included in each.

PRECISION BORING—R. Y. Ferner Co., Washington, is distributing a catalog of the Societe Genevoise, Geneva, Switzerland, covering its devices for precision boring. It describes the application of its jig borer to various problems of laying out, drilling and boring holes in jigs and fixtures or in direct production in the manufacture of parts for special machinery. It is well illustrated.

RAIL INSPECTION—A card for use by railroad track men has been published by Robert W. Hunt Co., engineers, Chicago, illustrating rail fissures. The Hunt organization inspects rails for 65 per cent of the railroads of the United States. In making records of rail failures it is important to recognize the type of fissure to aid in setting up a proper record of such failures. The card is intended as an aid to this result.

WELDING ROD—High test welding rod, designed for making stronger welds in steel, is described in a booklet published by Oxweld Acetylene Co., New York. The book is in two main divisions, the first giving reasons for specifying high test rod and the second how to use it to the best advantage. Subjects discussed include demand for superior welded joints, history of the development of the high test rod, strength of joints made with this rod, principles of joint design and actual melting technique to assure maximum results.

Pipe and Tube Prices—Plate Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2¼ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLING

Butt Weld

	Black	Galv.
⅛ and ¼-inch	+11	+36
⅜-inch	23	5
½-inch	28	11
¾-inch	31	15
1 and 1¼-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+13	+48
⅜-inch	23	7
½-inch	28	12
¾-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3⅛ to 3¾-inch	56 off
4-inch	59 off
4½ to 6-inch	48 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. On 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2⅛-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¾ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	42 off

SEAMLESS HOT ROLLED

1¾-inch	39 off
2 and 2¼-inch	40 off
2½ and 2¾-inch	48 off
3-inch	54 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	**12-gage**	**16c**
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{9}{32}$-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{9}{32}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A-B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet.....No extra

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c

Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum. Can be equipped with power operated loading hopper.

LOGEMANN
SCRAP METAL PRESSES

Hydraulically compressed scrap commands at all times the *best price,* and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.

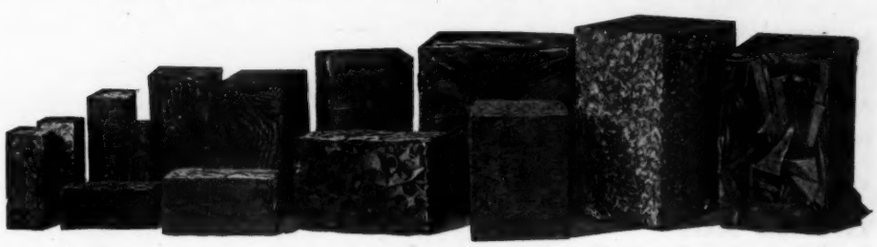
***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.

PIONEERS!

LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.

Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.



LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.

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Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium.
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Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago.

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